311

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Admiral	Ch. 20SX5EZ Tel. Rec.	311-2
Airline	WG-5002D, WG-5003D Tel. Rec. Prod. Chg. Bul. 149	311-1
Crestwood	404 Recorder	311-3
Emerson	838 (Ch. 120274)	311-4
Fleetwood	800 Tel. Rec.	311-5
General Electric	905, 906, 907, 915, 916	311-6
Guild	484	311-7
Hallicrafters	TW-100, TW-101, TW-102	311-8
Magnavox	Ch. AMP-142AB	311-9
Magnavox	Ch. CR-714AA	311-10
Monitoradio	MCA-100-L	311-11
Muntz	421C1, 421C2, 421T1, N, 421T2, 521ST1, 521ST2 (Ch. 47A4) Tel. Rec. Prod. Chg. Bul 149	311-1
Philco	D-655 (Codes 121, 123), D-661 (Code 121)	311-12
Sentinel	1U-352, 1U-352-2, 352	311-13
Silvertone	3248, 4248 (Ch. 488.986)	311-14
Sparton	21CL12, U, 21CL13, U, 21CM11, U, 21CM12, U, 21CM13, U, 21TL10, U, 21TM10, U (Ch. 15V215, P, T, 16U215, P, T) Tel. Rec.	311-15
Trav-ler	5510	311-16
Truetone	D2471	311-17
Westinghouse	H-916T17A, H-916TU17A, H-919T17A, H-919TU17A, H-920T17A, H-920TU17A, H-921T17A, H-921TU17A, H-924T21A, C, H-924TU21C, H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C, H-965K21C, H-965KU21C, H-966K21C, H-966KU21C, H-974T21, H-974TU21, H-975T21, H-975TU21, H-976T21, H-976TU21, H-978T17, H-978TU17, H-979T17, H-979TU17, H-980T17, H-980TU17 (Ch. V-2340-25, V-2341-15, -25, -35, -41, -45, V-2350-204, V-2351-204, -304, -404) Tel. Rec.	311-18

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 274

Muntz models 421T1, 421T1N and 421T2 (Ch. 47A4) were covered in Photofact Folder 10 – Set 274.

Models 421C1, 421C2, 521ST1 and 521ST2 are added, along with late production changes, with the publication of this bulletin.

There are three versions of chassis 47A4. We shall refer to them as the "A", "B" and "C" versions. The main difference is the changing of V5, V6 and V7. Following is a complete comparison of the three versions.

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"A" VERSION

The 1st. video IF input stage is changed. A partial schematic is given in Fig. 1 showing the new arrangement.

The sync coupling unit is revised. A partial schematic is shown in Fig. 2 showing the new circuit.

"B" VERSION

The 1st. video IF input stage is changed. A partial schematic is given in Fig. 1 showing the new arrangement.

V5 (3rd. video IF Amp.-video det.), V6 (video output-sync separator) and V7 (sound IF amp.-sync amp.) are changed to 6AN8's .The pin connections of a 6AN8 are shown in Fig. 3.

The sync separator and sync amplifier circuit has been revised. A partial schematic is given in Fig. 4 showing the new circuit.

"C" VERSION

The "C" version is a combination of the "A" and "B" versions. V5 (3rd. video IF amp.-video det.)is a 6AN8. V6 (video output-sync separator) is a 6AN8. V7 (sound IF amp.-sync amp.) is a 6U8.

The sync coupling network is revised. A partial schematic is shown in Fig. 2 showing the new circuit.

The sync separator and sync amplifier circuit has been revised. A partial schematic is given in Fig. 4 showning the new circuit.

The following production changes were made in late production and apply to all models.

NEW TUNER

Some models may have the new tuner (part #PR-0237) installed. A schematic of this tuner is shown in Fig. 5.

COMPONENT CHANGE

R45 is omitted.

R32 is increased from 22Ω to 47Ω.

C21 is added in some models.

R53 is decreased from 47KΩ to 27KΩ.

MUNTZ MODELS 421C1, 421C2, 421T1, 421T1N, 421T2, 521ST1, 521ST2 (Ch. 47A4)

PRODUCTION CHANGES
BULLETIN 149

PRODUCTION CHANGES
BULLETIN 149

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R77 is added in some models.

When V5 is a 6AM8, a 2.65Ω wire wound filament dropping resistor is added in place of the filament wire from V4 to V5.

R36 is decreased from 220KΩ to 150KΩ.

C22 is decreased from 1000MMF to 50MMF.

C36 is increased from 7.5MMF to 8.2MMF.

An 18KΩ resistor is added across L14.

R38 is decreased from 27KΩ to 18KΩ.

R68 is increased from 10KΩ to 18KΩ.

R6, vertical linearity control is increased from 250KΩ to 350KΩ.

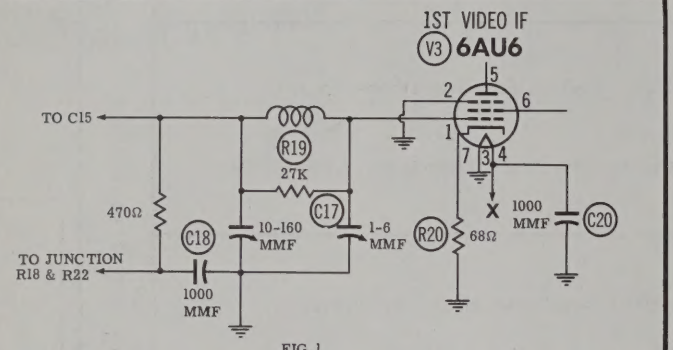

FIG. 1

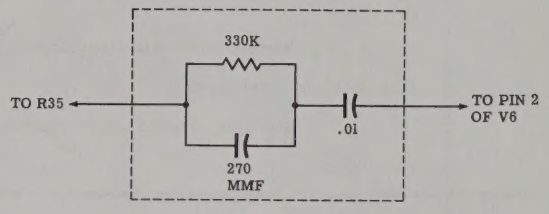

FIG. 2

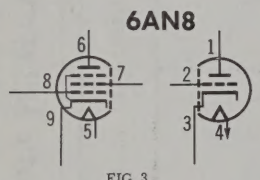

FIG. 3

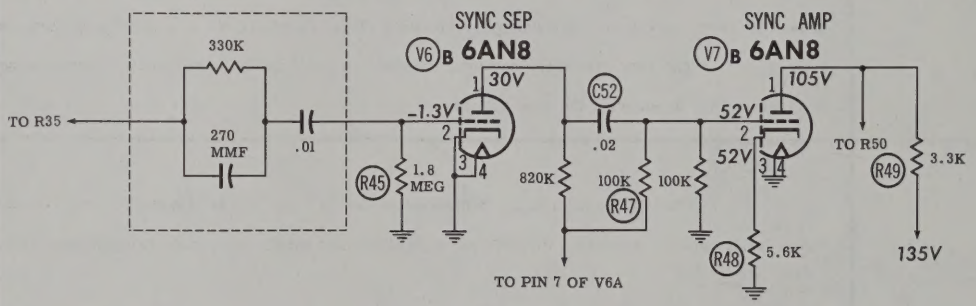

FIG. 4

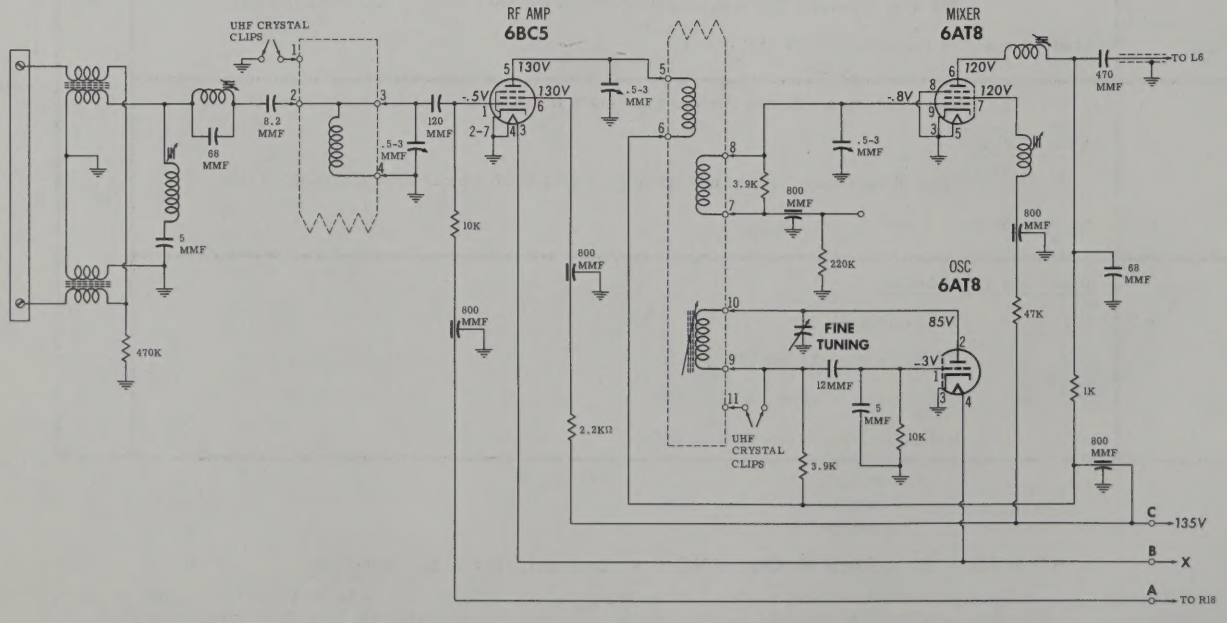

FIG. 5

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 290

AIRLINE MODELS WG-5002D, WG-5003D

Airline Models WG-5002C, WG-5003C, WG-5102B and WG-5103B were covered in Photofact Folder 3 – Set 290.

Models WG-5002D and WG-5003D are electrically identical, except tuner #25A1127 is incorporated. A schematic and alignment procedure are given in this bulletin.

OSCILLATOR ALIGNMENT

Connect negative lead of a 4.5 volt bias supply to the IF AGC line. Connect the positive lead to chassis.
The channel oscillator adjustment screws are reached thru a hole in the front of the tuner chassis. The correct oscillator adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp) 207MC (10MC Swp) 201MC (10MC Swp) 195MC (10MC Swp) 189MC (10MC Swp) 183MC (10MC Swp) 177MC (10MC Swp) 85MC (10MC Swp) 79MC (10MC Swp) 69MC (10MC Swp) 63MC (10MC Swp) 57MC (10MC Swp)	211.25MC 215.75MC 205.25MC 209.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC 83.25MC 87.75MC 77.25MC 81.75MC 67.25MC 71.75MC 61.25MC 65.75MC 55.25MC 59.75MC	13 12 11 10 9 8 7 6 5 4 3 2 	Vert. Amp. to output of video detector. Low side to chassis.	A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12	Adjust to place sound marker in trap notch as in Fig. 1. Video marker should be at 50%.

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RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the tuner AGC line. Connect positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 22KΩ to point (A). Low side to chassis.	A13, A14, A15	Adjust for response similar to Fig. 2 with markers above 90%.
3.	"	"	213MC (10MC Swp) 201MC (10MC Swp) 195MC (10MC Swp) 189MC (10MC Swp) 183MC (10MC Swp) 177MC (10MC Swp) 85MC (10MC Swp) 79MC (10MC Swp) 69MC (10MC Swp) 63MC (10MC Swp) 57MC (10MC Swp)	211.25MC 215.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC 83.25MC 87.75MC 77.25MC 81.75MC 67.25MC 71.75MC 61.25MC 65.75MC 55.25MC 59.75MC	13 11 10 9 8 7 6 5 4 3 2 	"	"	Check for response similar to Fig. 2. If markers fall below 70% on any channel make compromise adjustments of A13, A14 and A15 with channel switch set to that channel, then recheck all other channels to see that they have not been seriously affected.

40MC TRAP ADJUSTMENT

Interference falling in the 40MC range may be reduced by adjusting A16 for MINIMUM interference.

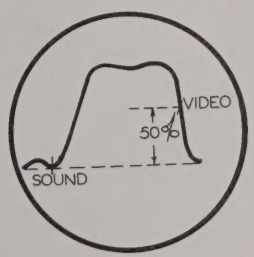


FIG. 1

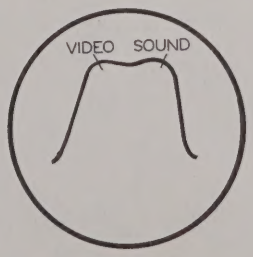
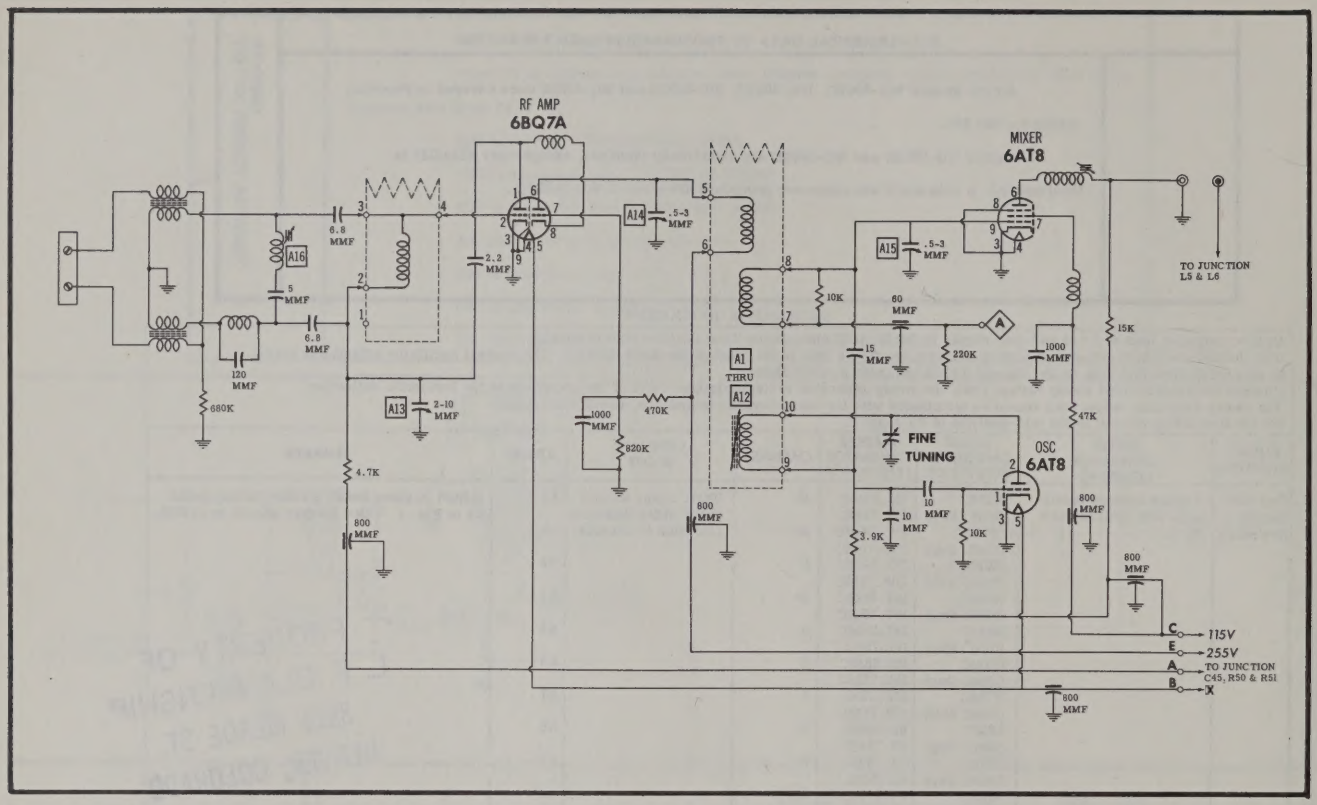


FIG. 2


RF AMP
6BQ7A
MIXER
6AT8
OSC
6AT8
FINE
TUNING
A1
THRU
A12
A13
A14
A15
A16
A
6.8
MMF
5
MMF
120
MMF
680K
2.2
MMF
2-10
MMF
4.7K
800
MMF
.5-3
MMF
1000
MMF
470K
820K
10K
60
MMF
15
MMF
220K
1000
MMF
15K
47K
10
MMF
3.9K
TO JUNCTION
L5 & L6
C
115V
E
255V
A
TO JUNCTION
C45, R50 & R51
B
X

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

ADMIRAL CHASSIS 20SX5EZ

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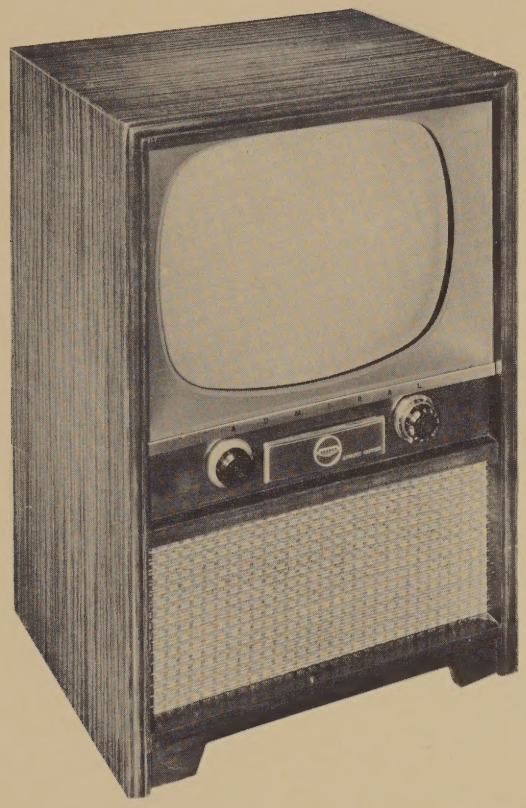

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ADMIRAL
CHASSIS 20SX5EZ

ADMIRAL MODEL CS2306BZN

TRADE NAME	Admiral Models CS2306BZN, CS2306Z, CS2307BZ, CS2307Z (Ch. 20SX5EZ)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.65 Amp. @ 117 Volts
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 1
Horizontal Sweep Circuit Adjustments 16
Parts List and Descriptions ..... 12 thru 14
Photographs
- Cabinet-Rear View 16
- Capacitor Identification 3, 10
- Chassis-Top View 11
- RF Tuner 15
- Resistor Identification 4, 9
- Trans., Inductor & Alignment Identification 11

Resistance Measurements 8
Servicing in the Field 1
Schematic 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs and UHF dial from front panel of cabinet.

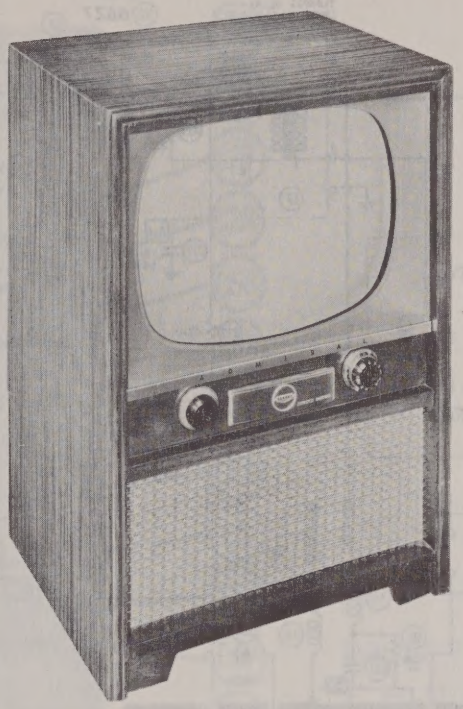
2. Remove 10 wood screws and 1 metal screw. Remove rear cover.

3. Disconnect speaker plug.

4. Remove 4 chassis bolts. Remove chassis.

5. Remove 2 speaker nuts. Remove speaker.

NOTE: If it is necessary to remove the chassis for servicing it is also necessary to remove the speaker. The filter choke and the audio output transformer is mounted on the speaker and must be connected to the receiver for proper operation.



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MODEL	CHASSIS
CS2306BZN, CS2306Z, CS2307BZ, CS2307Z	20SX5EZ

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 wood screws holding wood strip at the top edge of the safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-range position and adjust the horizontal frequency slug (L25) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L24) located on bottom of chassis.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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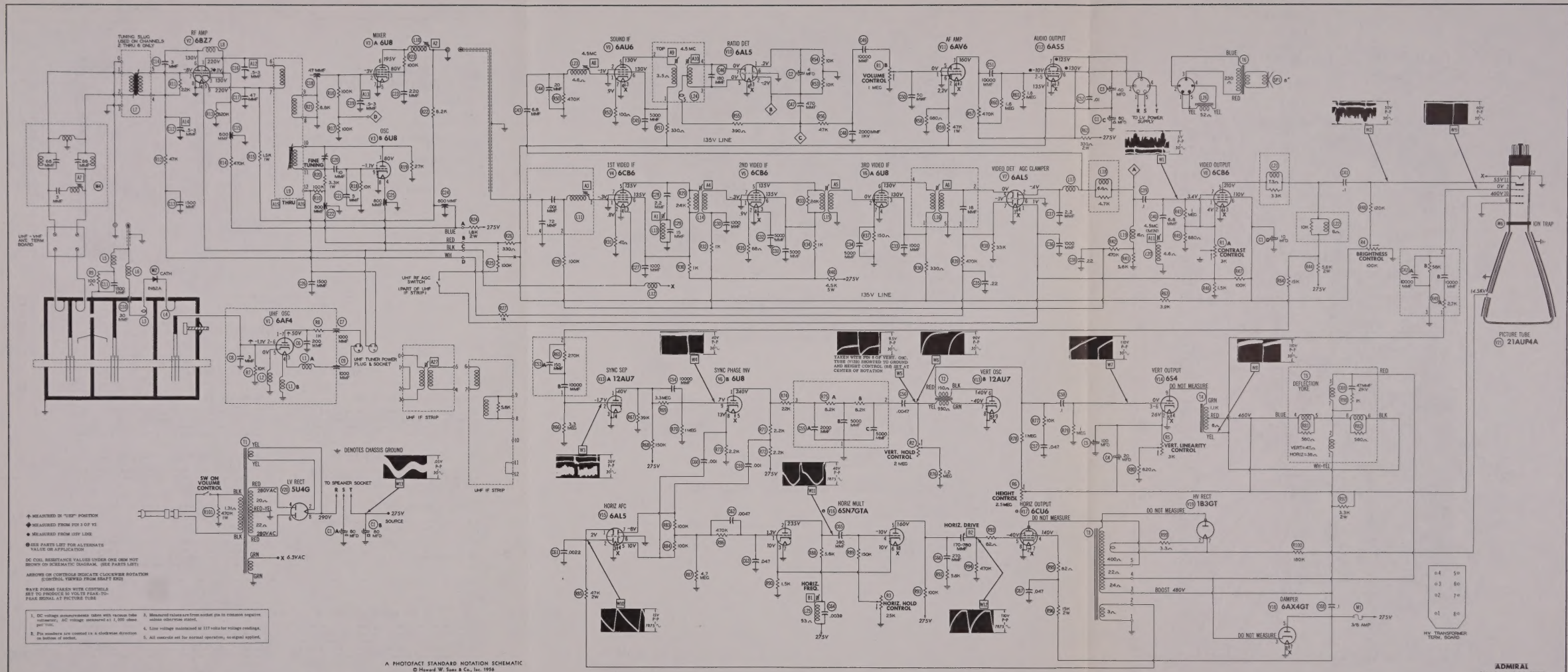

◆ MEASURED IN "USE" POSITION

◆ MEASURED FROM PIN 3 OF V2

● MEASURED FROM 135V LINE

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST).

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

*WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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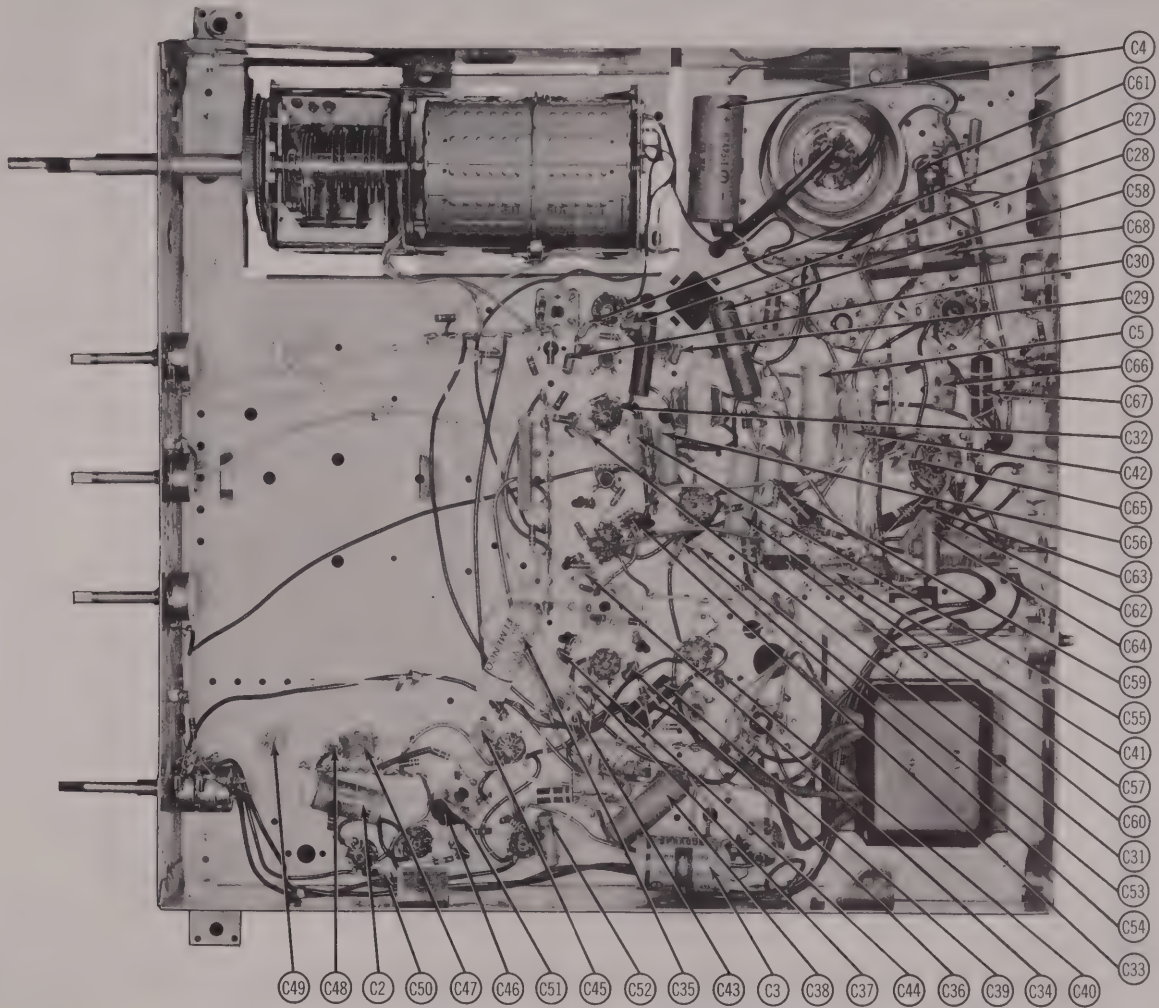

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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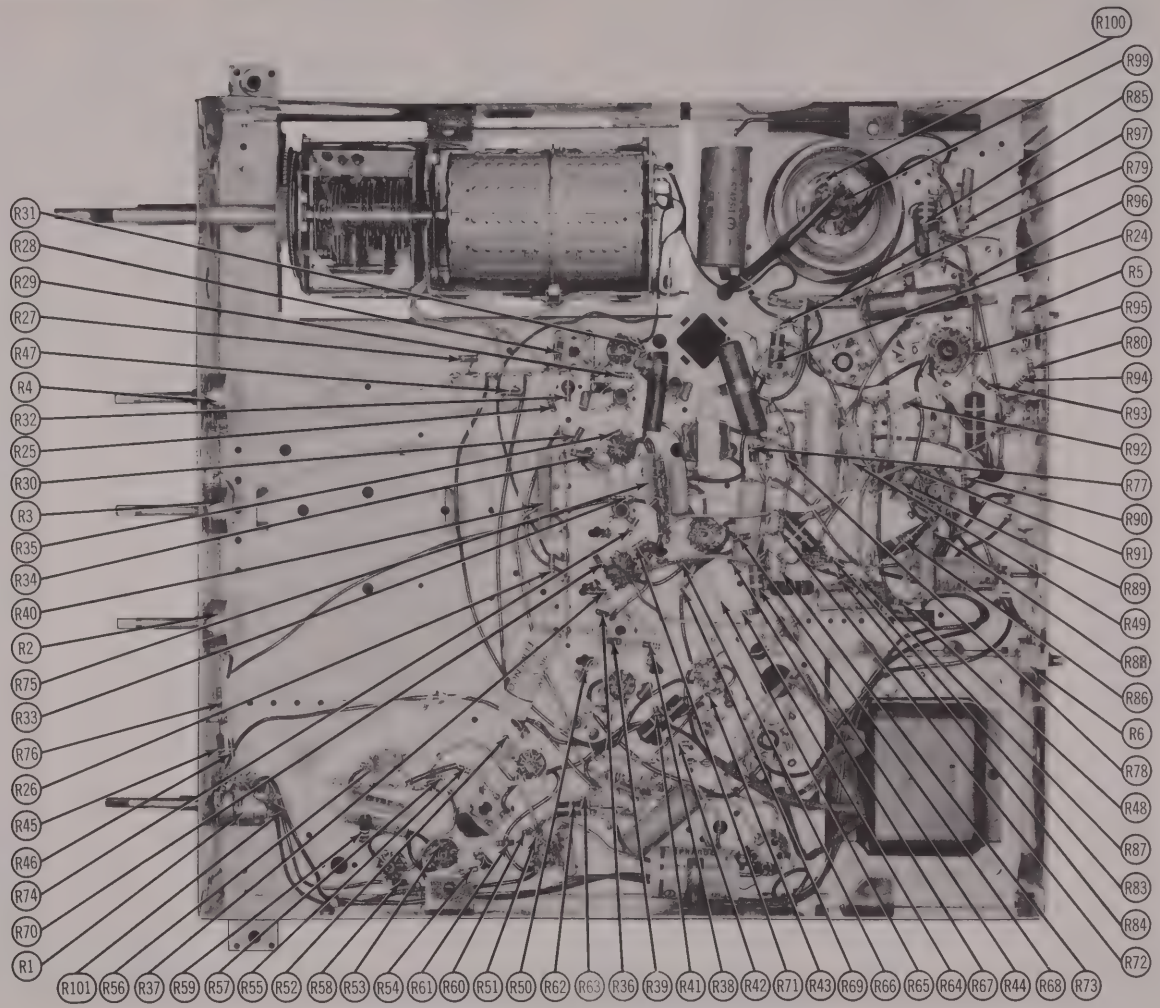

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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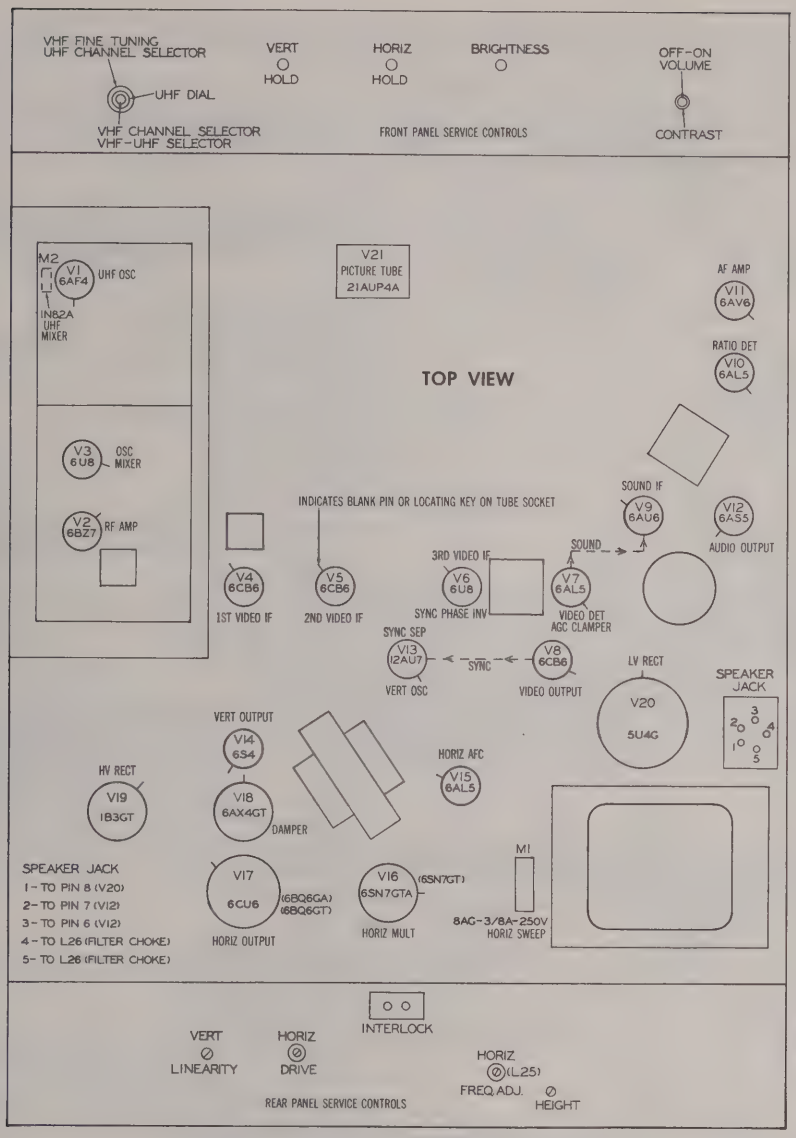
TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V20**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7, V12 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V21**
Has pic, no sound - **V9, V10, V11, V12**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V6, V13**
No horiz. sync - **V6, V15, V16**
No vert. or horiz. sync - **V6, V13**

SWEEP FAILURE
No raster, has sound - **V16, V17, V18, V19, V21, Fuse (M1)**
No vertical deflection - **V13, V14**
Poor vert. linearity or foldover - **V13, V14**
Poor horiz. linearity or foldover - **V16, V17, V18**
Narrow picture - **V16, V17, V18, V19, V20**
Vert. off freq. - **V6, V13**
Horiz. off freq. - **V6, V15, V16**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal oscillator tube (V16) to disable the high voltage. Allow 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C30. Connect positive lead to chassis. Disconnect the antenna lead-in and connect a short jumper across the antenna terminals. Set the contrast control fully counterclockwise. Use only enough sweep generator output to produce useable indication on VTVM. (Use lowest DC scale.) Signal generator should be checked against a crystal calibrator or other frequency standard for absolute frequency calibration.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis near V3.	47.25MC (Unmod)	13 or any unused high band channel	DC probe thru decoupling filter (Fig. 1) to point (A). Common to chassis.	A1	Preset A2 and A3 fully counter clockwise. Attenuate generator output to maintain not more than 1 volt at VTVM. Adjust A1 for MINIMUM deflection.
2.	"	"	45.3MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	43.9MC	"	"	A3	Adjust for maximum deflection. This is a temporary adjustment. Final adjustment occurs in step 4. Repeat step 2.
4.	"	"	45.3MC	"	"	A3	Adjust for maximum deflection.
5.	"	"	"	"	"	A4	"
6.	"	"	43.3MC	"	"	A5	"
7.	"	"	43.95MC	"	"	A6	"
8.	"	Across antenna terminals.	43.95MC	2 or any unused low-band channel	"	A7	If necessary, use maximum signal generator output. Adjust A7 for MINIMUM deflection. Repeat steps 1 and 5.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment". Use only enough sweep generator output to provide usable indication on the scope. If a separate marker generator is used couple it loosely to the high side of the sweep generator output lead on tube shield. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis near V3.	44.0MC (10MC Swp)	41.25MC 43.0MC 43.95MC 45.75MC 47.25MC	13 or any unused high-band channel	Vert. Amp. thru decoupling filter (Fig. 1) to point (A). Low side to chassis.		Check for response similar to Fig. 2. If unequal peaks occur, SLIGHTLY retouch A3 and A5. If after adjusting A3 and A3 response is still not similar to Fig. 2, repeat steps 1 thru 9. If a suitable response still cannot be obtained after repeating steps 1 thru 9 it may be necessary to check for a defective video IF amplifier tube or circuit component.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

If a signal generator capable of producing a 4.5MC signal with an accuracy of ±1KC is not available follow the procedure outlined under "Sound IF Alignment Using A TV Signal And VTVM".

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 2 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod)	Any unused channel	DC probe to point (B). Common to chassis.	A8, A9	Attenuate generator output to maintain not more than -1 volt at VTVM. Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Final adjustment of A10 is best made with a TV station tuned in. Adjust A10 for clearest sound and MINIMUM buzz. Point of MINIMUM buzz should occur between two buzz peaks which should occur when A10 is turned SLIGHTLY in one direction and then the other.

SOUND IF ALIGNMENT USING TV SIGNAL AND VTVM

Tune in a local TV station and adjust the signal input into the receiver for approximately -5 volts on the VTVM. If the signal input is too strong, the signal may be reduced by inserting an attenuator in series with the antenna and antenna terminals. If a suitable attenuator is not available, stray feed the signal into the receiver by disconnecting the antenna lead in and placing it near the receiver antenna terminals. The receiver should be restored to normal operating condition before attempting to tune in a local TV station.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Not used	Not used	Not used	Any local station	DC probe to point (B). Common to chassis.	A8, A9	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to pin 2 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any unused channel	Vert. Amp. to point (A). Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
11.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A10	Reconnect C2. Adjust so that 4.5MC marker occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Connect a 10MMF capacitor from pin 5 (plate) of 6CB6 (V8) to pin 7 (cathode) of 6AU6 (V9).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.01MFD	High side to pin 2 (plate of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod)	Any unused channel	DC probe to point (B). Common to chassis.	A11	Adjust for MINIMUM deflection on lowest DC scale of VTVM.

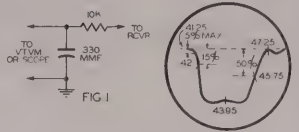

FIG 1

FIG 2

FIG. 3

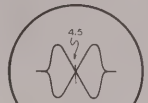

FIG. 4

FIG. 5

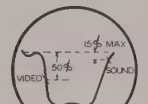

FIG 6

FIG. 7

ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in a local TV station and adjust A11 for MINIMUM 4.5MC beat in the picture. An indication of 4.5MC beat interference in the picture is in the form of a gauze like pattern of very fine vertical or diagonal lines. The pattern will vary as the sound varies forming a very fine herring bone pattern.

VHF RF AND MIXER ALIGNMENT

Connect negative lead of a 3 volt bias supply to the tuner AGC buss (white wire to tuner). Positive lead to chassis. Sweep and marker generator outputs should be attenuated for minimum outputs that will give usable indications on scope. The marker pips should be just barely visible on response curve. If a separate marker generator is used, couple it loosely to antenna terminals. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead	195MC (20MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to point (D). Low side to chassis.	A12, A13	Adjust for response similar to Fig. 5.
14.	"	"	85MC (20MC Swp)	83.25MC 87.75MC	6	"	A14	"
15.	"	"	213MC (20MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any high band channel, make compromise adjustments of A12 and A13 with channel switch set to that channel. Check all other high band channels to see that they have not been seriously affected.
			207MC (20MC Swp)	205.25MC 209.75MC	12			
			201MC (20MC Swp)	199.25MC 203.75MC	11			
			189MC (20MC Swp)	187.25MC 191.75MC	9			
			183MC (20MC Swp)	181.25MC 185.75MC	8			
			177MC (20MC Swp)	175.25MC 179.75MC	7			
16.	"	"	79MC (20MC Swp)	77.25MC 81.75MC	5	"		Check for response similar to Fig. 5. If marker falls below 70% on any low band channel, make compromise adjustment of A14 with channel switch set to that channel. Check all other low band channels to see if they have been seriously affected.
			69MC (20MC Swp)	67.25MC 71.75MC	4			
			63MC (20MC Swp)	61.25MC 65.75MC	3			
			57MC (20MC Swp)	55.25MC 59.75MC	2			

VHF OSCILLATOR ALIGNMENT

Leave the bias connected as under "Video IF Alignment". The channel oscillator adjustment screws are reached through a hole just above and slightly to the left of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (20MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupling filter (Fig. 2) to point (A). Low side to chassis.	A15	Adjust to place video marker at 50% on response curve as in Fig. 6. Sound marker should fall as less than 5% on curve. It may be necessary to temporarily increase sweep and marker generator output and scope gain to view the sound marker.
			207MC (20MC Swp)	205.25MC 209.75MC	12		A16	
			201MC (20MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (20MC Swp)	193.25MC 197.75MC	10		A18	
			189MC (20MC Swp)	187.25MC 191.75MC	9		A19	
			183MC (20MC Swp)	181.25MC 185.75MC	8		A20	
			177MC (20MC Swp)	175.25MC 179.75MC	7		A21	
			85MC (20MC Swp)	83.25MC 87.75MC	6		A22	
			79MC (20MC Swp)	77.25MC 81.75MC	5		A23	
			69MC (20MC Swp)	67.25MC 71.75MC	4		A24	
			63MC (20MC Swp)	61.25MC 65.75MC	3		A25	
			57MC (20MC Swp)	55.25MC 59.75MC	2		A26	

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ALTERNATE VHF OSCILLATOR ALIGNMENT

Tune in any local TV station. Set the fine tuning control to its mid-range position. Adjust the oscillator channel strip adjustment for clearest picture and best sound. Repeat procedure for all stations available in the area.

UHF 44MC IF ALIGNMENT

Connect bias as under "VHF RF And Mixer Alignment". Remove IF input cable from tuner output socket for step 18. Reinsert IF input cable for step 19. Remove mixer crystal (M2) from holder. If separate marker generator is used, loosely couple to high side of sweep generator. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	100Ω Carbon Resistor	High side thru 100Ω resistor to negative clip of crystal holder. Low side to chassis.	43.5MC (53MC Swp)	41.25MC 45.75MC	UHF	Vert. Amp. thru 10KΩ to point (D). Low side to chassis	A27	Adjust to obtain curve similar to Fig. 7.
19.	"	"	"	"	"	Vert. Amp. thru decoupling filter (Fig. 2) to point (A). Low side to chassis.		Increase bias to -6 volts. Check for response curve similar to Fig. 6. If curve does not resemble Fig. 6 within tolerances, make compromise adjustment of A27. If curve cannot be made to resemble Fig. 6., check to make sure all instructions have been followed. Check V1 and V2 and repeat alignment.

UHF TUNER ALIGNMENT

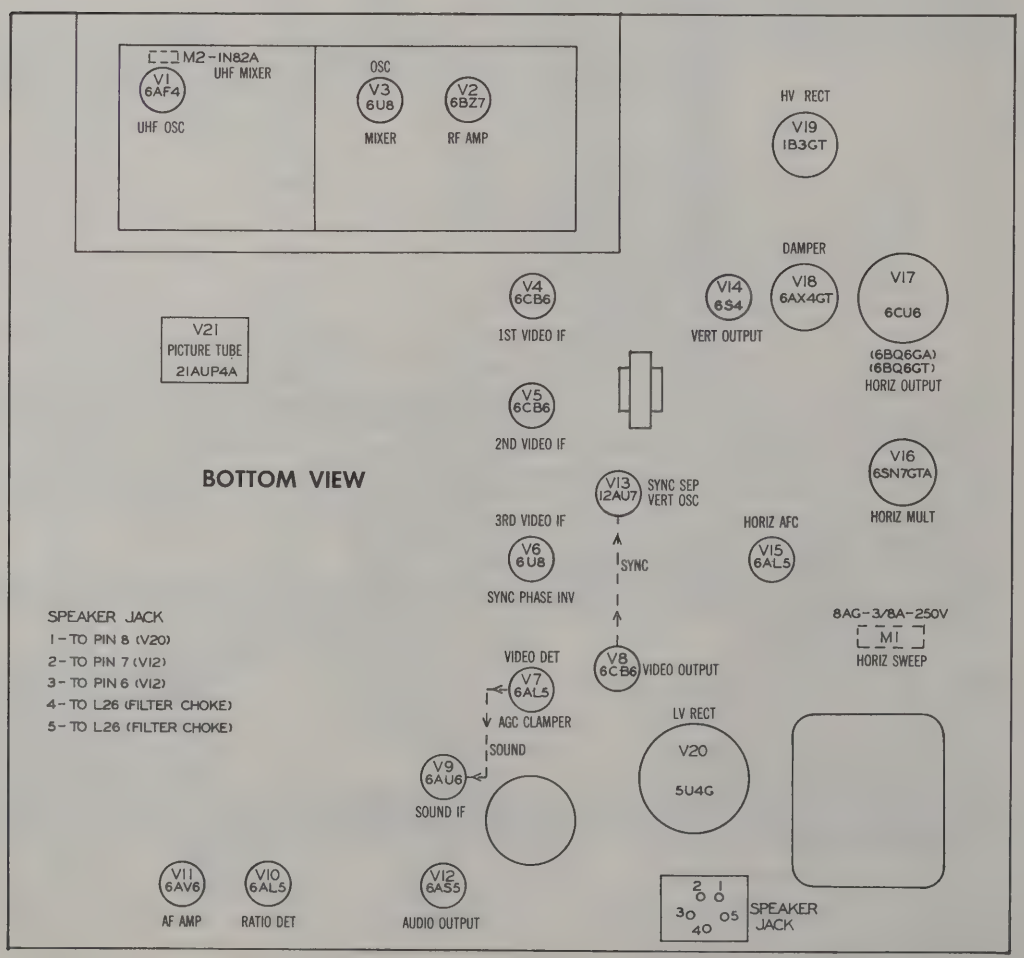
The UHF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of the UHF portion of this receiver is not recommended in the field.

ADMIRAL CHASSIS 20X5EZ

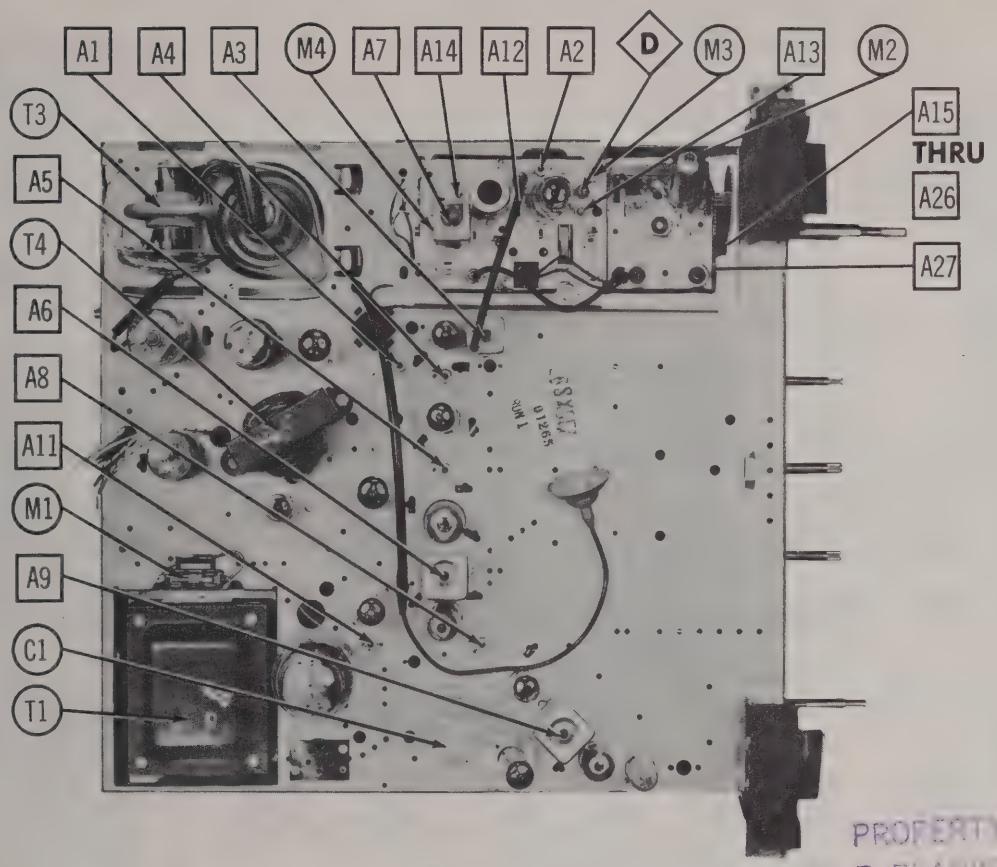
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	*■ 4. 6KΩ	10KΩ	. 1Ω	0Ω	0Ω	10KΩ	*■ 4. 6KΩ		
V 2	6BZ7	† 3. 3KΩ	330KΩ	INF	0Ω	. 1Ω	INF	550KΩ	0Ω	† 3. 3KΩ
V 3	6U8	■ 3. 6KΩ	200KΩ	† 110KΩ	. 1Ω	0Ω	† 10KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	600KΩ	47Ω	. 1Ω	0Ω	† 5. 5KΩ	† 5. 5KΩ	0Ω		
V 5	6CB6	470KΩ	68Ω	. 1Ω	0Ω	† 5. 5KΩ	† 5. 5KΩ	0Ω		
V 6	6U8	† 4. 4KΩ	0Ω	■ 330Ω	0Ω	. 1Ω	■ 330Ω	150Ω	2. 2KΩ	750KΩ
V 7	6AL5	1KΩ	5. 6KΩ	0Ω	. 1Ω	0Ω	0Ω	33KΩ		
V 8	6CB6	1Meg	400Ω	. 1Ω	0Ω	† 5. 6KΩ	■ 3. 9KΩ	400Ω		
V 9	6AU6	470KΩ	0Ω	. 1Ω	0Ω	■ 330Ω	■ 330Ω	100Ω		
V 10	6AL5	10KΩ	10KΩ	. 1Ω	0Ω	INF	0Ω	INF		
V 11	6AV6	150KΩ	680Ω	. 1Ω	0Ω	0Ω	0Ω	† 470KΩ		
V 12	6AS5	15KΩ	900KΩ	. 1Ω	0Ω	900KΩ	† 380Ω	† 600Ω		
V 13	12AU7	† 120KΩ	3. 3Meg	0Ω	0Ω	0Ω	▲ 2Meg	2. 5Meg	0Ω	. 1Ω
V 14	6S4	NC	1. 9KΩ	1Meg	. 1Ω	0Ω	1Meg	NC	NC	▲ 4. 4KΩ
V 15	6AL5	47KΩ	47KΩ	0Ω	. 1Ω	4. 8Meg	0Ω	4. 8Meg		
V 16	6SN7GTA	5Meg	† 5. 6KΩ	1. 5KΩ	170KΩ	† 100KΩ	1. 5KΩ	0Ω	. 1Ω	
V 17	6CU6	NC	0Ω	TP	† 15KΩ	470KΩ	TP	. 1Ω	0Ω	TOP CAP ▲ 22Ω
V 18	6AX4GT	NC	NC	300KΩ	NC	† 52Ω	NC	. 1Ω	0Ω	
V 19	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 422Ω
V 20	5U4G	NC	50KΩ	NC	20Ω	NC	22Ω	TP	50KΩ	
V 21	21AUP4A	. 1Ω	56KΩ	PIN 6 0Ω	PIN 10 ▲ 3. 3KΩ	PIN 11 ■ 150KΩ	PIN 12 0Ω			

* MEASURED IN UHF POSITION.
■ MEASURED FROM 135V LINE.
† MEASURED FROM PIN 8 OF V20.
▲ MEASURED FROM PIN 3 OF V18.



TUBE PLACEMENT CHART



CHASSIS TOP VIEW

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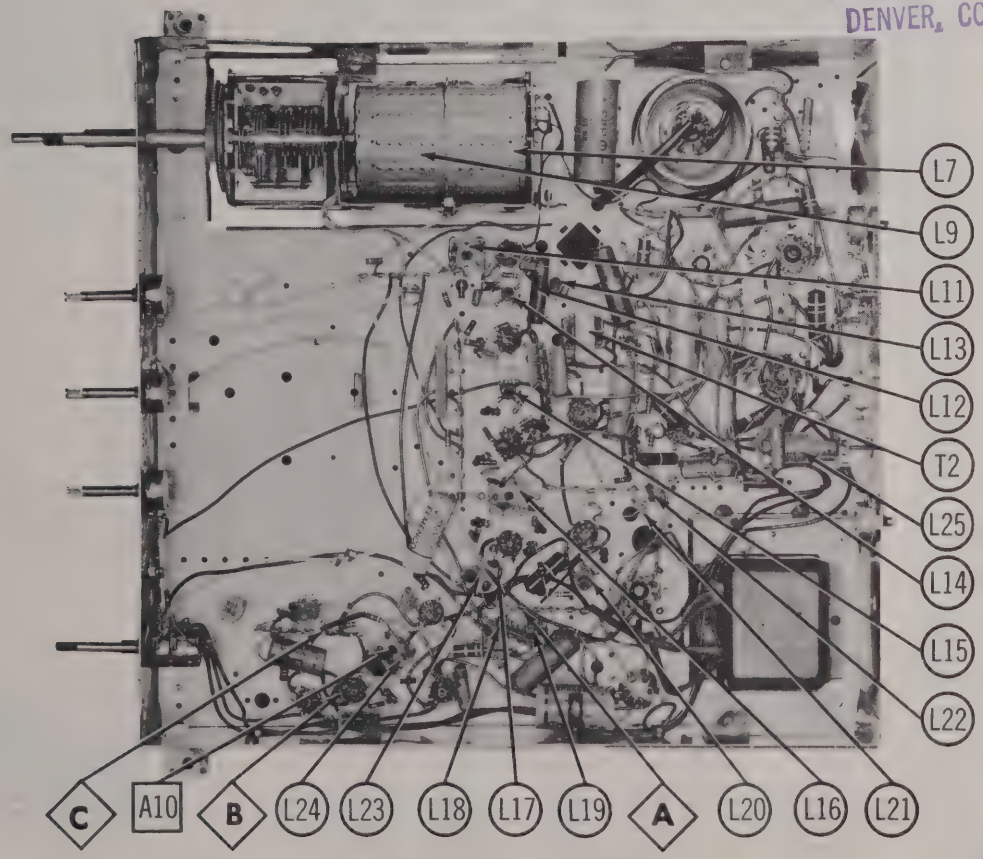

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

SET 311 FOLDER 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	UHF Oscillator	6AF4	6AF4	
V2	RF Amplifier	6BZ7	6BZ7	
V3	Mixer - Oscillator	6U8	6U8	
V4	1st. Video IF Amplifier	6CB6	6CB6	
V5	2nd. Video IF Amplifier	6CB6	6CB6	
V6	3rd. Video IF Amplifier- Sync Phase Inverter	6U8	6U8	
V7	Video Detector- AGC Clamper	6AL5	6AL5	
V8	Video Output	6CB6	6CB6	
V9	Sound IF Amplifier	6AU6	6AU6	
V10	Ratio Detector	6AL5	6AL5	
V11	AF Amplifier	6AV6	6AV6	
V12	Audio Output	6AB5	6AB5	
V13	Sync Separator- Vert. Oscillator	12AU7	12AU7	
V14	Vert. Output	6B4	6B4	
V15	Horiz. AFC	6AL5	6AL5	
V16	Horiz. Mult.	6SN7GTA	6SN7GTA	6SN7GT may be used as an alternate
V17	Horiz. Output	6CU8	6CU8	6BQ6GT or 6BQ6GA may be used as an alternate
V18	Damper	6AX4GT	6AX4GT	
V19	HV Rectifier	1B3GT	1B3GT	
V20	LV Rectifier	5U4G	5U4G	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: CBS Part No.	REPLACEMENT DATA: GENERAL ELECTRIC Part No.	REPLACEMENT DATA: SYLVANIA Part No.	NOTES
V21	21AUP4A	21AUP4A ①		21AUP4A ②	① Aluminized ② Silver screen "85"
				21AUP4V ③	
	21AUP4	21AUP4		21AUP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: PYRAMID Part No.	REPLACEMENT DATA: SANGAMO Part No.	REPLACEMENT DATA: SPRAGUE Part No.
C1A	.e80	350	67D15-111			FP331.3	TM-806060-350	T-115	TVL-3643
B	.e80	350				TC43	TD-10-150	FM-1815	TVA-1606
C	.e80	200							
D	10	150							
C2	4	90	67A1-9	PRS150V4	BR560	TC30	TD-4-90	MMT-0505	TVA-1303
C3	40	200	67A1-21	PRS250V40	BR4025	TC38	TD-40-250	FM-2540	TVA-1511
C4	20	475	67A15-1	PRS500V20	BR2050	TC33	TD-20-475	B-125	TVA-1504
C5	100	50	67D8-102	PRS50V100	BR1501	TC3501	TD-100-50	MTH-5010	TVA-1310

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: SPRAGUE Part No.	NOTES
C6	300		94A75-120							
C7	1000		94Z64-121							
C8	3		94Z64-86	NPO-D2S	TCZ-3R3	Z007	NP0A-030	Z7-553	5TCCB-V33	
C9	1000		94Z64-121							
C10	30		94A75-129							
C11	1500		94A75-118	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C12	.5-3		94A45-23		SSB-3		31U5-01-QR5	CT565A		
C13	1500		94A75-118	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C14	3		94Z64-86	NPO-D2S	TCZ-3R3	Z007	NP0A-030	Z7-553	5TCCB-V33	
C15	800		94C37-90							
C16	.5-3		94A45-23		SSB-3		31U5-01-QR5	CT565A		
C17	47		94Z64-35	BPD-000047	DD-470	G083	831-470	UC-5447	5GA-Q47	
C18	47		94A75-121		MPT-50					
C19	.5-3		94A45-23		SSB-3		31U5-01-QR5	CT565A		
C20	10		94Z64-81	N75S-DI0	TCH-10	N018	N75SK-100	N7-541	5TCU-Q1	
C21	5		94Z64-100							
C22	600		94C37-90							
C23	220		94Z64-89	BPD-00022	DD-221	G081	831-221	UC-5223	5GA-T23	
C24	800		94C37-90							
C25	800		94C37-90							
C26	1500		94A75-118	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C27	1000		65C6-41	81U000	DS-102	TP83	GP2L-102	UC-531	5HK-D1	
C28	2.5		65C6-86	NP0-B12.2	TCZ-2R2	TZ06	NP0A-2R2		5TCCB-V22	
C29	15		65C6-50	NP0-B15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C30	1000		65C6-41	81U000	DS-102	TP83	GP2L-103	UC-531	5HK-D1	
C31	5000		65C10-1	BPD-006	DD-502	K080	811-005	DC-525	5HK-D5	
C32	5000		65C10-1	BPD-006	DD-502	K080	811-005	DC-525	5HK-D5	
C33	1000		65C6-41	81U000	DS-102	TP83	GP2L-103	UC-531	5HK-D1	
C34	5000		65C10-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C35	.33	200		P2S3N-33		CUBP1P33		P7M03	2TM-P22	
C36	1000		65C6-41	81U000	DS-102	TP83	GP2L-103	UC-531	5HK-D1	
C37	2.2		65C6-86	NP0-B12.2	TCZ-2R2	TZ06	NP0A-2R2		5TCCB-V22	
C38	.22	200		P2S3N-22		CUBP1P22		PT4022	2TM-P22	
C39	.1	200		P2S3N-1	DP-104	CUBP1P1		PT401	1TM-P1	
C40	8.8		65C6-71				N330A-6R8			
C41	.1	400		P4S3N-1	DP-104	CUB4P1		PT401	4TM-P1	
C42A	10000		†63C6-12	BPD-01	DD-103	K083	811-01	DC-511	5HK-E1	
B	10000			BPD-01	DD-103	K083	811-01	DC-511	5HK-E1	
C43	8.8		65C6-71				N330A-6R8			
C44	30		65C6-51	NP0-D3O	TCZ-30	Z023	NP0K-300	Z7-543	5TCC-Q3	
C45	5000		65C10-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C46	180		65C6-59							
C47	470	500	65C6-5	1469-00047	D6-471	5R5T47	811-471	MC3241	M3-347	
C48	2000	1000		HVD-15-2000	DD-203	VD2	801-002	DC-523	10HK8-D22	
C49	10000			BPD-01	DD-103	K083	811-01	DC-511	5HK-E1	
C50	50		65C6-4	81S0	D6-500	TP30	GP3K-500	UC-545	5GA-Q5	
C51	10000			BPD-01	DD-103	K083	811-01	DC-511	5HK-E1	
C53	.01	600	65C10-3	BPD-01	D6-103	CUB6M1	GP3-333-103	PT501	5TM-E1	
C53A	150		*63C6-8	81S0	D6-151	TP38	GP3K-151	UC-5315	5GA-T15	
B	10000			BPD-01	DD-103	K080	811-01	DC-511	5HK-E1	
C54	10000			BPD-01	DD-103	K080	811-01	DC-511	5HK-E1	
C55A	2000			BPD-002		K072	801-002	DC-522	5HK-D2	
B	5000		65C6-11	BPD-005	‡CPC-105	K080	811-005	DC-525	5HK-D5	
C	5000			BPD-005		K080	811-005	DC-525	5HK-D5	
C56	.0047	600		814700	D6-472	CUB6D47	GP3-333-473	PT5347	5TM-D47	
C57	.047	600								
C58	.1	600		P6S3N-1	DP-104	CUB6P1		PT601	6TM-P1	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: SPRAGUE Part No.	NOTES
C59	.001	500		81D00	D6-102	CUB6D1	GP2L-102	PT521	5TM-D1	
C60	.001	600		81D00	D6-102	CUB6D1	GP2L-102	PT521	6TM-D1	
C61	.0022	500		81Z200	D6-222	CUBD3S	GP3-333-223	PT5237	6TM-D22	
C62	.0047	600		814700	D6-472	CUBE547	GP2-333-472	PT5247	6TM-D47	
C63	.047	200		BPD-05	DP-503	CUB2S47		PT4147	2TM-S47	
C64	.0015	400		1454-00039		IB5D39		MC3453	M3-339	
C65	390	500	65B21-391	1469-00039	D6-391	5R5T39	[redacted]	MC3243	M3-339	
C66	270	500	65B21-271	1469-00027	D6-271	5R5T27	811-271	MC3241	M3-327	
C67	.047	400		HVD-15-405	DP-503	CUB4S47		PT4147	4TM-S47	
C68	.1	600		P6S3N-1	DP-104	CUB6P1		PT601	6TM-P1	
C69	47	3000	65C10-8		D3K0-475	V2Q47		5KV-470	DC30447	30GA-Q47

† Items C42A, C42B, R49A and R49B are combined in one unit.
* Items C52A, C52B and R65 are combined in one unit.
‡ Items C55A, C55B, C55C, R75A and R75B are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CLAROSTAT Part No.	REPLACEMENT DATA: IRC Part No.	REPLACEMENT DATA: MALLORY Part No.	INSTALLATION NOTES
R1A	300Ω		75B11-28	F1-15	RTV-577	QJ-765 *	UE4185	Contrast (Panel)
B	1Meg			R2-54				Volume (Rear)
C	Switch			K3-1				Attach to R1B.
R2A	2Meg		75C13-45	AB-75	A47-2Meg-S	Q11-139	U-58	Vertical Hold
B	Shaft		Not Req.	AK-4	KS5-3	Not Req.	Not Req.	Attach to R2A.
R3A	25KΩ		75C13-44	AB-26	A47-25K-S	Q11-120	U-29	Horizontal Hold
B	Shaft		Not Req.	AK-4	KS5-3	Not Req.	Not Req.	Attach to R3A.
R4A	100KΩ		75C13-43	AB-60	A47-100K-S	Q11-123	U-41	Brightness
B	Shaft		Not Req.	AK-4	KS5-3	Not Req.	Not Req.	Attach to R4A.
R5A	500Ω		75C20-7	AB-8	A47-500Ω-S	Q11-13	U-8	Vertical Linearity
B	Shaft		Not Req.	AK-1	FKS-1/4	RQ	Not Req.	Attach to R5A.
R6A	2.5Meg		75C10-1	BX-83	A47-2.5Meg-S	Q11-239	SU-585	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	RQ	Not Req.	Attach to R6A.

* Concentrikit Equivalent, K-3 Kit, Base Elements and Shafts, B17-112, P1-128 (Panel) B13-117, R3-212 (Rear) T6-1 (Switch)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R7	10KΩ			BTS-1000	
R8	1000Ω			BTS-100	
R9	100Ω			BTS-100S	
R10	100KΩ			BTS-104K	
R11	22KΩ			BTS-22K	
R12	47KΩ			BTS-47K	
R13	820KΩ			BTS-820K	
R14	470KΩ			BTS-470K	
R15	1500Ω			BTA-1500	
R16	100KΩ				
R17	100KΩ				
R18	10KΩ				
R19	37KΩ				
R20	330KΩ			BTA-3300	
R21	680KΩ				
R22	820KΩ				
R23	100KΩ			BTB-1000	
R24	180KΩ	3		BTB-180K	
R25	100KΩ			BTB-100K	
R26	330Ω			BTB-330	
R27	1000Ω			BTB-1000	
R28	100KΩ				
R29	24KΩ 5%			BTB-24K	
R30	1000Ω			BTB-1000	
R31	47Ω			BTB-47	
R32	470KΩ			BTB-470K	
R33	24KΩ 5%			BTB-24K	
R34	1000Ω			BTB-1000	
R35	68Ω			BTB-68	
R36	330Ω			BTB-330	
R37	150Ω			BTB-150	
R38	33KΩ			BTB-33K	
R39	470KΩ			BTB-470K	
R40	450Ω	5	81A17-1	1.5AA-4500	
R41	560Ω			BTB-5600	
R42	470KΩ			BTB-470K	
R43	1Meg			BTB-1Meg	
R44	560Ω	3		BTB-5600	
R45	68Ω			BTB-68K	
R46	150Ω			BTB-1500	
R47	100KΩ			BTB-100K	
R48	180KΩ			BTB-180K	
R49A	270Ω		† 63C6-12	BTB-2700	
B	56Ω			BTB-56K	
R50	470KΩ			BTB-470K	
R51	330Ω			BTB-330	
R52	100Ω			BTB-100	
R53	10KΩ			BTB-10K	
R54	10KΩ			BTB-10K	

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R55	330Ω			BTS-390	
R56	47KΩ			BTS-47K	
R57	470KΩ			BTS-470K	
R58	680Ω			BTS-680	
R59	47KΩ			BTA-47K	
R60	1.8Meg 5%			BTS-1.8Meg5%	
R61	1.5Meg 5%			BTS-1.5Meg 5%	
R62	330Ω			BTS-330	
R63	3300Ω			BTS-3900	
R64	15KΩ			BTS-15K	
R65	270KΩ		* 63C6-8	BTS-270K	
R66	3.3Meg			BTS-3.3Meg	
R67	33KΩ			BTS-39K	
R68	150KΩ 5%			BTS-150K 5%	
R69	3.3Meg			BTS-3.3Meg	
R70	1Meg			BTS-1Meg	
R71	2200Ω			BTS-2200	
R72	2200Ω			BTS-2200	
R73	2200Ω			BTS-2200	
R74	22KΩ			BTS-22K	
R75A	8000Ω		‡ 63C6-11	BTS-8200	
B	8200Ω			BTS-8200	
R76	1.5Meg			BTS-1.5Meg	
R77	10KΩ 5%			BTS-10K 5%	
R78	1Meg			BTS-1Meg	
R79	1Meg			BTS-1Meg	
R80	820Ω			BTS-820	
R81	5600				
R82	560Ω				
R83	100KΩ 5%				
R84	100KΩ 5%				
R85	47KΩ				
R86	470KΩ				
R87	4.7Meg				
R88	5600Ω				
R89	150KΩ				
R90	1500Ω				
R91	100KΩ				
R92	5600Ω				
R93	82Ω				
R94	470KΩ				
R95	82Ω				
R96	15KΩ	2			
R97	3300Ω	3		BTB-3300	
R98	1000Ω				
R99	5.3Ω			BW-5.3	
R100	180KΩ			BTS-180K	
R101	470KΩ	1		BTA-470K	Note 1

Note 1. Some versions use a 270KΩ 1W in this application.
† Items R49A, R49B, C42A, C43B are combined in one unit.
* Items R65, C55A, C55B are combined in one unit.
‡ Items R75A, R75B, C55A, C55B, C55C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: Halldorson Part No.	REPLACEMENT DATA: Merit Part No.	REPLACEMENT DATA: Stancor Part No.	REPLACEMENT DATA: Thordarson Part No.	REPLACEMENT DATA: Triad Part No.
T1	117VAC	568VCT ①	5VAC ②	6.3VAC ③	80C35-3	PT733	P2836	P6164	26R33 ④	R-41BC ①
	1.65A	.250A	3A	9.1A						

① Parallel 6.3V ③ 6A. Tape 6.3V ③ 1.2A winding.
② Tape 500VCT winding. Tape 5V ② 3A winding. Parallel 6 phase 6.3V ③ 5A windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: ADMIRAL Part No	REPLACEMENT DATA: Halldorson Part No	REPLACEMENT DATA: Merit Part No	REPLACEMENT DATA: RCA TYPE No	REPLACEMENT DATA: Ram Part No	REPLACEMENT DATA: Stancor Part No	REPLACEMENT DATA: Thordarson Part No	REPLACEMENT DATA: Triad Part No
T2	Vert. Osc. Trans.	79B18-4	H6703	A-3003	209T1 ①	V405	A-8125	26A03	A-97X
T3	Horiz. Output Trans.	79C60-1	FB460 *	HVO-26*		X139 * ⑤	A-8254 *	FLY-75 *	D-49 * ① ⑤
T4	Vert. Output Trans.	79B43-4	21900 ②	A-3824 ④		V312	A-8141	26S54	A-109X ④
T5A	Yoke(70°) Horiz. (19.5MC)	94C51-3 ⑤	DF805 ⑤ ⑦	MDF-73 ⑦	223D1 ⑦	Y70P18/43 ⑦	DY-11A ⑤ ⑦	Y-10 ⑤ ⑦	Y-32-1 ⑤ ⑦
B	Vert.(57MH)								

① Drill new mounting hole(s).
② Use 18 to 1 turns ratio.
③ Cut and tape yellow lead.
④ Connect as auto transformer.
⑤ Includes capacitor C69 and resistors R81, R82 and R98.
⑥ Use original rear cover and centering device.
⑦ Connect horizontal damping network across terminals #7 and #3. Use original network if necessary.
⑧ Remove capacitor from terminals #1 and #2. Use original horizontal damping network if necessary.
⑨ Reverse rear mounting bracket.
⑩ Requires 2 turns on filament winding.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5		5	5	5	5
4	4	4		4	4	4	7
3	3	3		3	3	3	⑦
2	2	2		2	2	2	4
1	1	1		1	1	1	3

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ADMIRAL Part No	REPLACEMENT DATA: Halldorson Part No	REPLACEMENT DATA: Merit Part No	REPLACEMENT DATA: Stancor Part No	REPLACEMENT DATA: Thordarson Part No	REPLACEMENT DATA: Triad Part No	NOTES
T6	4.3KΩ	4.3Ω	Part of spkr. 76B98-1	A3930	A3877	24S51	S-3X		

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: QUAM Part No.	REPLACEMENT DATA: RCA TYPE No	NOTES
SP1	8"	PM	4.3Ω	76B98-1	8A21	20S52	

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: MEISSNER Part No.	REPLACEMENT DATA: MERIT Part No.	REPLACEMENT DATA: MILLER Part No.	NOTES
L1A	Fil. Choke	0Ω		94Z75-118				
B	Fil. Choke	0Ω		94Z75-117				
L2	Cathode Choke	0Ω						
L3	UHF Osc. Coupling Coil	0Ω						
L4	UHF Osc. Coupling Coil	0Ω		94Z75-114				
L5	UHF IF Coil	0Ω		94Z75-115				
L6	UHF IF Coil	0Ω		94Z75-113				
L7A	VHF Ant. Coil	0Ω	0Ω	94Z75-53				Channel 1
B	VHF Ant. Coil	0Ω	0Ω	94Z75-53				Channel 3
C	VHF Ant. Coil	0Ω	0Ω	94Z75-54				Channel 5
D	VHF Ant. Coil	0Ω	0Ω	94Z75-55				Channel 5
E	VHF Ant. Coil	0Ω	0Ω	94Z75-56				Channel 6
F	VHF Ant. Coil	0Ω	0Ω	94Z75-57				Channel 7
G	VHF Ant. Coil	0Ω	0Ω	94Z75-58				Channel 8
H	VHF Ant. Coil	0Ω	0Ω	94Z75-59				Channel 9
I	VHF Ant. Coil	0Ω	0Ω	94Z75-60				Channel 10
J	VHF Ant. Coil	0Ω	0Ω	94Z75-61				Channel 11
K	VHF Ant. Coil	0Ω	0Ω	94Z75-62				Channel 12
L	VHF Ant. Coil	0Ω	0Ω	94Z75-63				Channel 13
M	UHF IF Strip	0Ω	0Ω	94Z75-51				
L8	Neut. Coil	0Ω		94D64-104				
L9A	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-72				Channel 2
B	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-73				Channel 3
C	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-74				Channel 4
D	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-75				Channel 5
E	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-76				Channel 6
F	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-77				Channel 7
G	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-78				Channel 8
H	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-79				Channel 9
I	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-80				Channel 10
J	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-81				Channel 11
K	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-82				Channel 12
L	VHF RF, Mixer Grid & Osc. Coils	0Ω		94Z75-83				Channel 13

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DENVER, COLORADO

ADMIRAL
CHASSIS 20SX5EZ

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
M	UHF IF Strip	0Ω		94E75-64				Includes 5.6KΩ resistor
L10	Conv. Plate	.1Ω		94D64-103				
L11	1st. Video IF	0Ω		72B119-1				Includes caps.
L12	Fil. Choke	0Ω		73A2-5	19-3001	TV-189	6175	.6 Microhenry
L13	47.25MC Trap	.6Ω		72D111-10	20-1049	TV-153	6225	
L14	2nd. Video IF	0Ω	0Ω	72D111-6	17-4523	TV-130	6219	
L15	3rd. Video IF	0Ω	0Ω	72D111-7	17-4522	TV-130	6219	
L16	4th. Video IF	0Ω	0Ω	72B133-1				
L17	Series Peaking Coil	.5Ω			19-1002		4606	2.4 Microhenries
L18	Series Peaking Coil	6.8Ω		73A5-15	19-3180 *	TV-184 *	6180 *	180 Microhenries, wound on 4.7KΩ resistor
L19	Shunt Peaking Coil	16Ω		73A5-7	19-3500		6174	500 Microhenries
L20	4.5MC Trap	4.6Ω		72B99-6	20-1004 ■	TV-151	1470	
L21	Series Peaking Coil	7.3Ω		73A5-13	19-3300 ▲		6130 ▲	284 Microhenries, wound on 33KΩ resistor
L22	Shunt Peaking Coil	8Ω		73A5-9	19-4400 ▲		6134 ▲	370 Microhenries, wound on 10KΩ resistor
L23	Sound IF	4.6Ω		72B99-7	20-1005 ■	TV-151	1470	
L24	Ratio Det.	3.5Ω	.2Ω	72B68-2	17-1033	TV-110	6205 ♦	Tertiary winding -.7Ω

* Parallel with 4.7KΩ resistor.
■ Disconnect capacitor in parallel.
▲ Parallel with 33KΩ resistor.
♦ Use adaptor plate.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L25	53Ω		94C17-3	19-1576	TV-163	6210			HS-5	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L26	.250A	52Ω	L 5HY	Part of speaker 78B98-1	C5037 ①	C2996 ①	C2326 ①	26C44	C-23X

① Mount choke under chassis.

FUSES

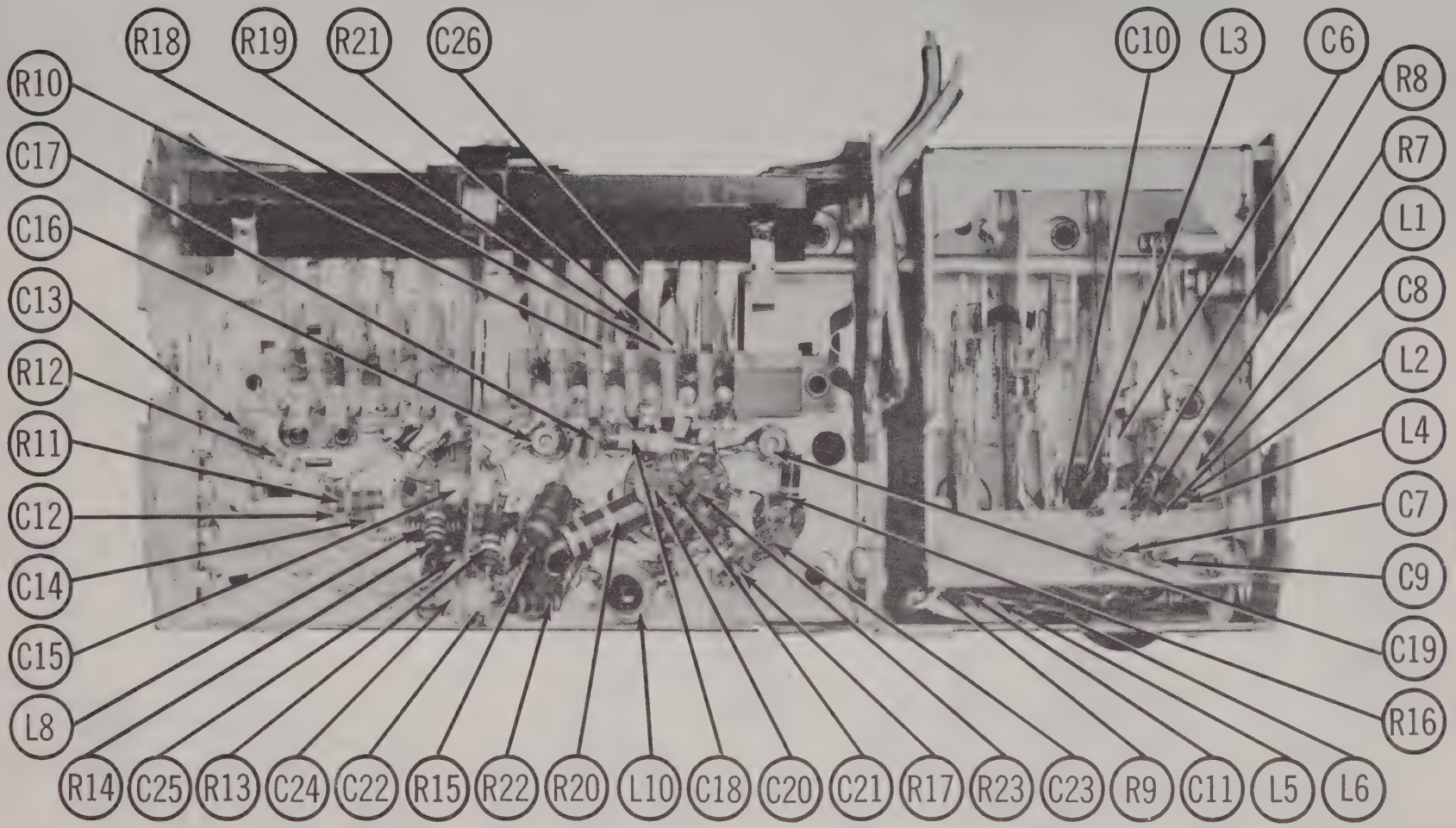
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ADMIRAL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	8AG	3/8A 250V	84A 4-3		362.375 (8AG - 3/8A)	387001	AGX 3/8	4520

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		ADMIRAL PART No.	SYLVANIA PART No.	
M2	1N82A		1N82A	UHF Mixer (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Tuner	94E75-1	UHF-VHF combination
M4	Trap	94D64-84	VHF Ant. input filter
M5	Centering Device		Part of deflection yoke (T5) rear cover
M6	Ion Trap	94A15-4	
B2	Trimmer Cap.	66A30-3	Horiz. Drive (170-780MMF)



RF TUNER-BOTTOM VIEW

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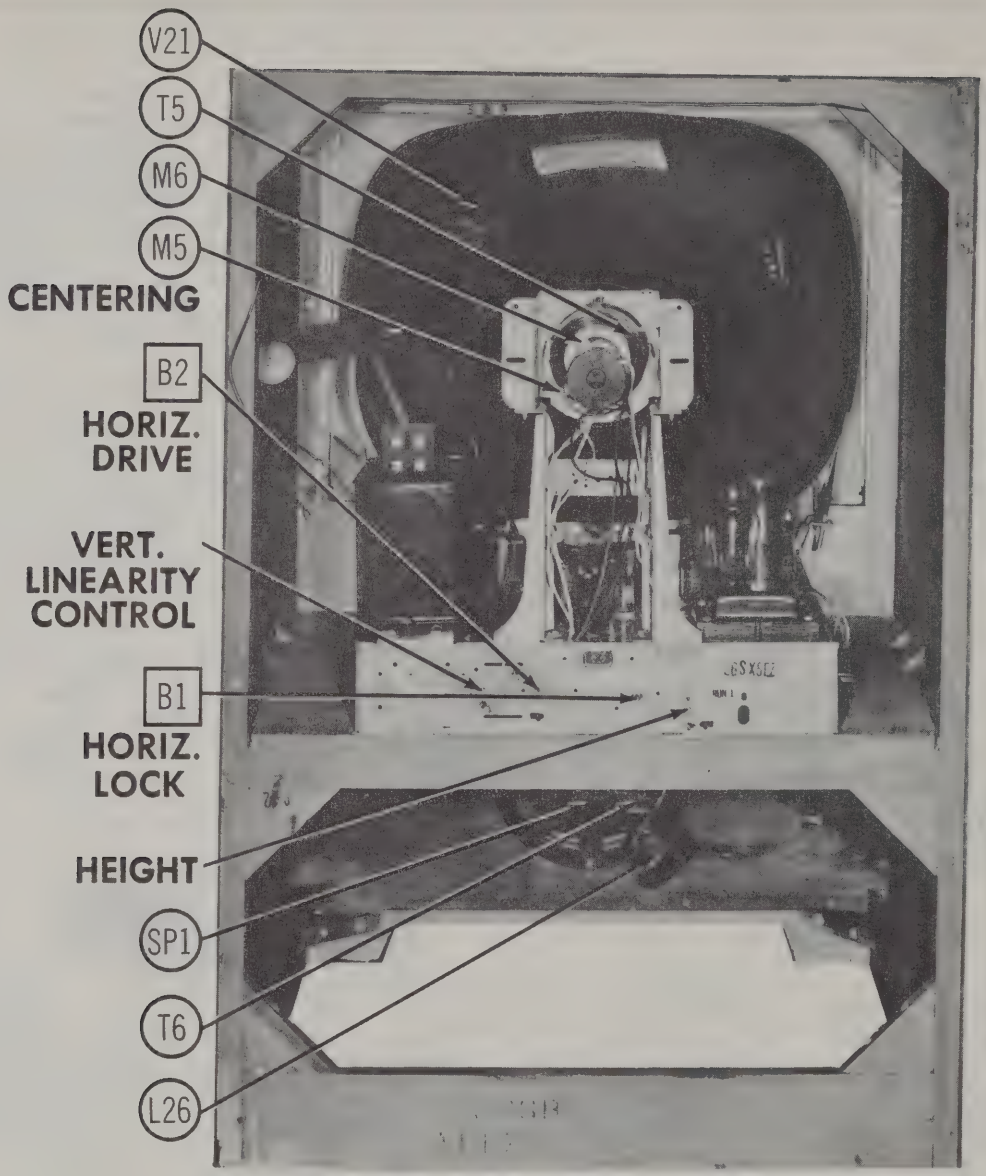

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set brightness control and contrast control for a normal picture.

Turn the horizontal hold control fully counter clockwise. Slowly turn the horizontal hold control clockwise, at the same time and switching the channel selector off channel and back again several times. If the picture does not remain in sync for at least three-fourths of the control range, set the control to the position at which horizontal sync is lost. Slowly turn the horizontal frequency slug (B1) to the right or left until the picture synchronizes.

HORIZONTAL DRIVE CONTROL ADJUSTMENT

Turn the horizontal drive control (B2) clockwise as far as possible. If a white line appears slowly turn counter clockwise until line disappears.

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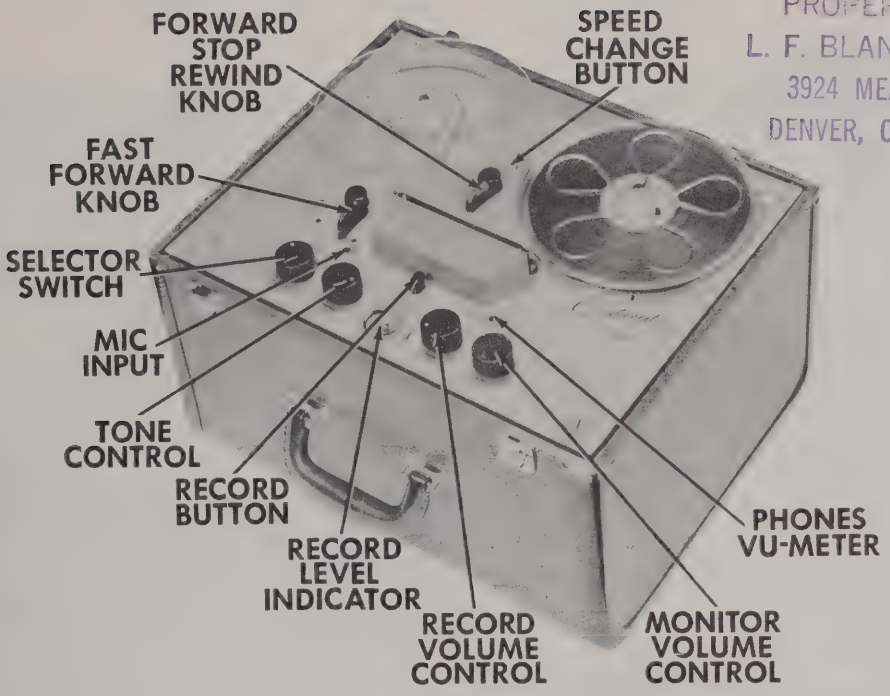

Figure 1

GENERAL INFORMATION

The Crestwood Model 404 Tape Recorder contains the tape transport mechanism, preamplifier, and power supply, housed in a vinyl covered case. The Crestwood Model 404 is designed to be used with your high fidelity system or with the high fidelity 10 watt amplifier and quality 8 inch speaker contained in portable Crestwood Model 402.

This recorder is designed to record and play back two tracks of material on standard width recording tape, doubling the playing time with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph (using a crystal or magnetic cartridge), in addition to those made directly from the microphone.

The Crestwood has two tape speeds, 7 1/2" and 3 3/4" per second. Using both tracks, the recording time is as follows:

Size Reel	Speed 3 3/4"	Speed 7 1/2"
5" (600 ft.)	1 hour	1/2 hour
7"(1200 ft.)	2 hours	1 hour

The Model 404 is designed to operate on 60 cycle, 105-120 volts, AC supply only.

CAUTION: Severe Damage Will Result If Connection Is Made To A Direct Current (DC) Line.

Manufactured by:

Crestwood Recorder Division
of
Daystrom Electric Corp.
753 Main Street
Poughkeepsie, New York

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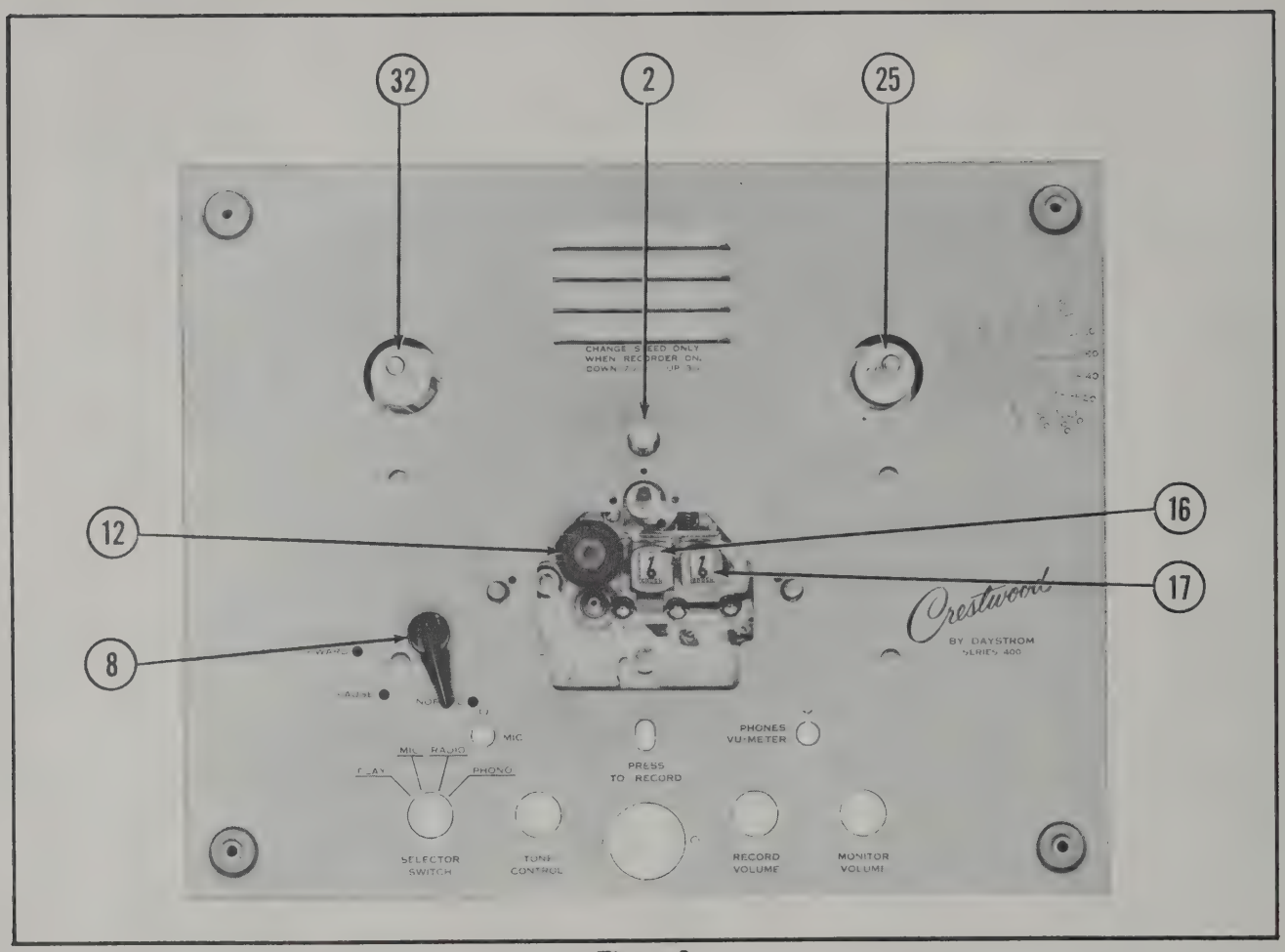

Figure 2

Specifications Of Model 404

Size-Portable Unit: 11" x 13 1/2" x 16"

Weight: 24 3/4 lbs.

Case: Heavy vinyl covering

Tape Speed: 7 1/2" per second and 3 3/4" per second

Track: Dual

Maximum Reel Size: 7"

Tape Wind: "A".

Track Selection: Manual Turnover.

Fast Rewind Speed: 20 times faster than speed setting.

Frequency Response: Maximum deviation + or -2db 30 to 13,000 cycles at 7 1/2" per second.

Distortion: Less than 2%.

Wow And Flutter: 0.3% or lower at 7 1/2" per second.

Bias And Erase Frequency: 75K.C.

Inputs: Microphone-panel jack. Radio-TV-Jack panel, rear of unit. Phonograph-jack panel, rear of unit.

Outputs: Monitor-panel jack. To power amplifier-jack at rear of unit.

OPERATING INSTRUCTIONS

Preparing The Crestwood For Recording-

1. Plug the AC power cord socket into the AC receptacle on the rear panel of the recorder case and insert the AC power cord plug into a convenient 105-120 volts, 60 cycle AC outlet.

2. Connect the 404 recorder to the 402 speaker and power amplifier by using the Audio Cable supplied with the 402. Also can be used with your own high fidelity system. The output jack on the rear panel of the 404 and the input jack on the side panel of the 402 are for this purpose.

Threading The Tape-

1. Place reel of tape on the right hand spindle so that the tape will lead off in a clockwise direction.

NOTE: This recorder uses Type "A" wound tape, i.e. the dull or magnetic coated side faces inward on the reel. If the tape used is Type "B" (coated side facing outward) the recording will be made at a very low sound level and the playback will be almost inaudible.

2. Place an empty reel on the left hand spindle. Be sure that both reels are fully seated and engaged with the drive pins on the spindles.

3. Unwind about 14 inches of tape. Hold a section of tape straight with both hands and insert the tape

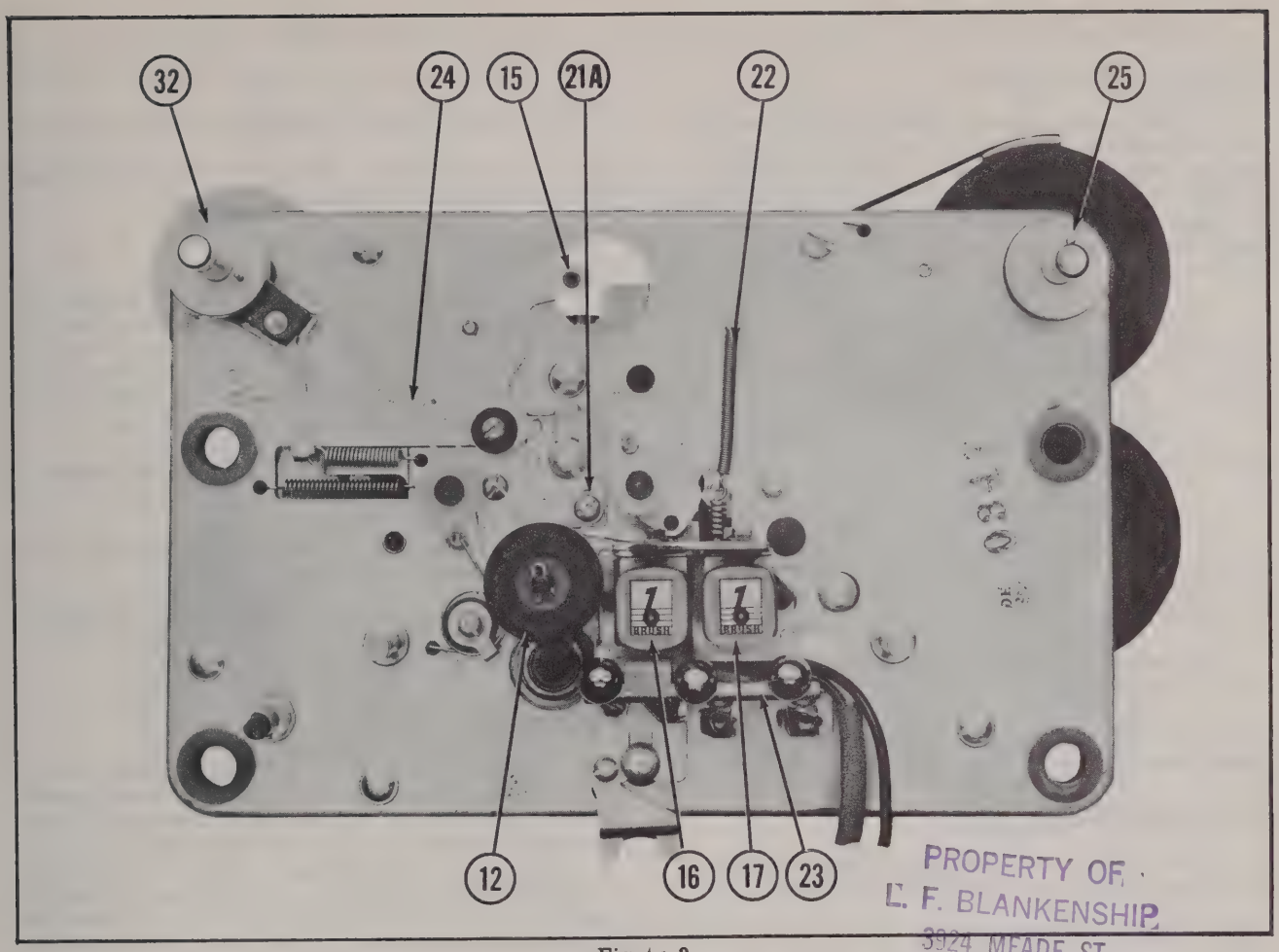

Figure 3

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into the tape slot. Feed the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel in a clockwise direction until the tape is secured and all slack is taken up between reels .

To Record From Microphone-

1. Insert the microphone plug into the jack marked "Mic. " on the top panel.

2. Turn "Monitor Volume" knob slightly to the right to turn on the amplifier. Allow a few seconds for the amplifier tubes to warm up before starting to record.

3. Turn the "Selector Switch" knob to "Mic. "

4. Hold the microphone approximately one foot from lips. Adjust "Record Volume" control until the recording indicator almost closes at the loudest sound . The unit is now set to record.

5. Hold "Press To Record" button down and turn the forward-reverse knob (1) to "Forward". The "Press to Record" button will now stay depressed in record position.

NOTE: Be certain fast forward control knob (8) is in "Normal" position. If not, the mechanism will not operate.

To Record From Phonograph-

Crestwood 404 Recorders have a phono circuit designed to match the output of modern magnetic phono pickups. Crystal pickup should be plugged into the microphone jack. (Shield to plug shield.) The phono circuit matches General Electric and Audak pickups . The Pickering cartridge needs a resistor of approximately 15,000 ohms connected across the phono plug to provide better match.

1. Connect the output of the phono pre-amplifier to the phono jack on the 404 panel. The connecting cable must be well shielded and short as practicable . (Sleeve of cable plug must be connected to shield of cable).

2. Turn "Monitor Volume" knob slightly to the right to turn on the amplifier. Allow a few seconds for the amplifier tubes to warm up before starting to record.

3. Turn "Selector Switch" to "Phono".

4. Start record playing and adjust "Record Volume" control until the record indicator almost closes on loudest peaks.

5. To monitor recording, set "Monitor Volume" control for desired listening level.

6. Hold "Press To Record" button down and turn forward-reverse knob (1) to "Forward". The "Press To Record" button will now stay depressed in record position. Start record to be recorded at desired starting point.

7. Adjust "Tone" control to desired position .

To Record From Radio Or TV-

Recordings can be made from a radio or television receiver by placing the microphone near the speaker ; however, this type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result will be recorded on the tape. A higher quality recording can be made by using a shielded cable equipped with a phono plug, connected as follows:

1. Insert phono plug into Radio-TV jack. Connect other end of shielded cable across output of radio receiver or across voice coil connections on radio or TV speaker.

2. Turn "Monitor Volume" knob slightly to the right to turn on the amplifier.

3. Turn "Selector Switch" to "Radio" position .

4. Start radio or TV playing and adjust "Record Volume" control until recording indicator almost closes on loudest peaks.

5. Hold "Press To Record" button down and turn forward-reverse lever (1) to Forward.

6. The "Tone" control is automatically disconnected when unit is in record radio position.

To Stop Tape Movement-

1. Tape movement may be stopped at any time by turning forward-reverse knob (1) to "Stop".

NOTE: When the recorder is not in use, forward-reverse knob (1) should be left in the "Stop" position.

Dual Track Operation-

NOTE: Recordings are made on half the width of the tape at one time. Since it is impossible to edit and splice one "track" without affecting the other, recordings which are to be edited should be limited to one track only.

1. After a reel of tape has been recorded, a second track may be recorded on the same reel (without rewinding) by removing the reel from the recorder , turning it over, then placing the full reel on spindle (25) and the empty reel on spindle (32).

2. Thread the tape and proceed with the recording as previously described.

3. After the second track has been recorded, the first track is ready to be played without rewinding, by changing reels as described in Step #1 above.

To Rewind-

To rewind the tape, turn forward-reverse knob to "Rewind" position.

To Play A Recording-

1. The speaker and power amplifier having been connected to the 404, the power cord from the amplifier -speaker is connected to 105-120 volts, 60 cycle A C outlet, and the switch on the amplifier speaker turn "On".

2. Turn "Selector Switch" to "Play".

3. Turn forward-reverse knob (1) to "Forward".

4. Adjust "Monitor Volume" to desired level .

5. Adjust "Tone" control to produce desired balance of high and low frequency response.

Fast Forward-

Any portion of a recording may be skipped, or any recording on a tape may be located in a few seconds by pivoting the fast forward control knob (8) in a clockwise direction. A few seconds of "Fast Forward" is equivalent to several minutes of playing time . The fast forward knob (8) has three positions.

(a)Normal, at which position it must remain at all times, except for "Fast Forward".

(b)Pause is the mid-position that brakes the reels and stops all tape movement.

(c)Fast Forward is the "Fast Forward" position .

ADJUSTMENTS

Pressure Pad Adjustment-

Check adjustment as follows: Thread a short length of tape between pressure pad and heads but not between capstan shaft and pressure roller (12). Place forward-reverse knob (1) in Forward position. Form a loop in the end of the tape in which a spring type scale can be fastened. By pulling on end of spring scale a pressure of from 1 1/4 to 1 1/2 oz. should be required to move tape.

If adjustment is necessary, the pressure can be increased or relieved by loosening screws (23A) that mount the guide assembly (23) to the mechanism, and moving guide assembly (23) toward or away from front of machine. (If sufficient movement of the guide cannot be attained, it may be necessary to remove the guide and increase the length of the slotted holes by filing.)

Record Head (16) Alignment Adjustment-

It is very important that the record head (16) be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result. There are two adjustments to be made. One is the head height. This adjustment is made by turning screws (81) until there is a clearance of 11/64" to 3/16" between the head mounting bracket (20) and the upper mechanism plate (33).

The other adjustment is for output and frequency response. To set this, obtain an alignment tape on which a 3,000 cycle tone has been recorded. If this special tape is not at hand, a fairly satisfactory adjustment can be made by using a tape on which the recording is known to be good. Place the tape on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. Play the tape and rock the head from side to side, the screw holding the head to the record head bracket (18) will allow you to do this. Notice the variation in the output voltage at the voice coil and tighten the head in the position of the highest output. Make sure the head has not moved up or down while rocking it. After

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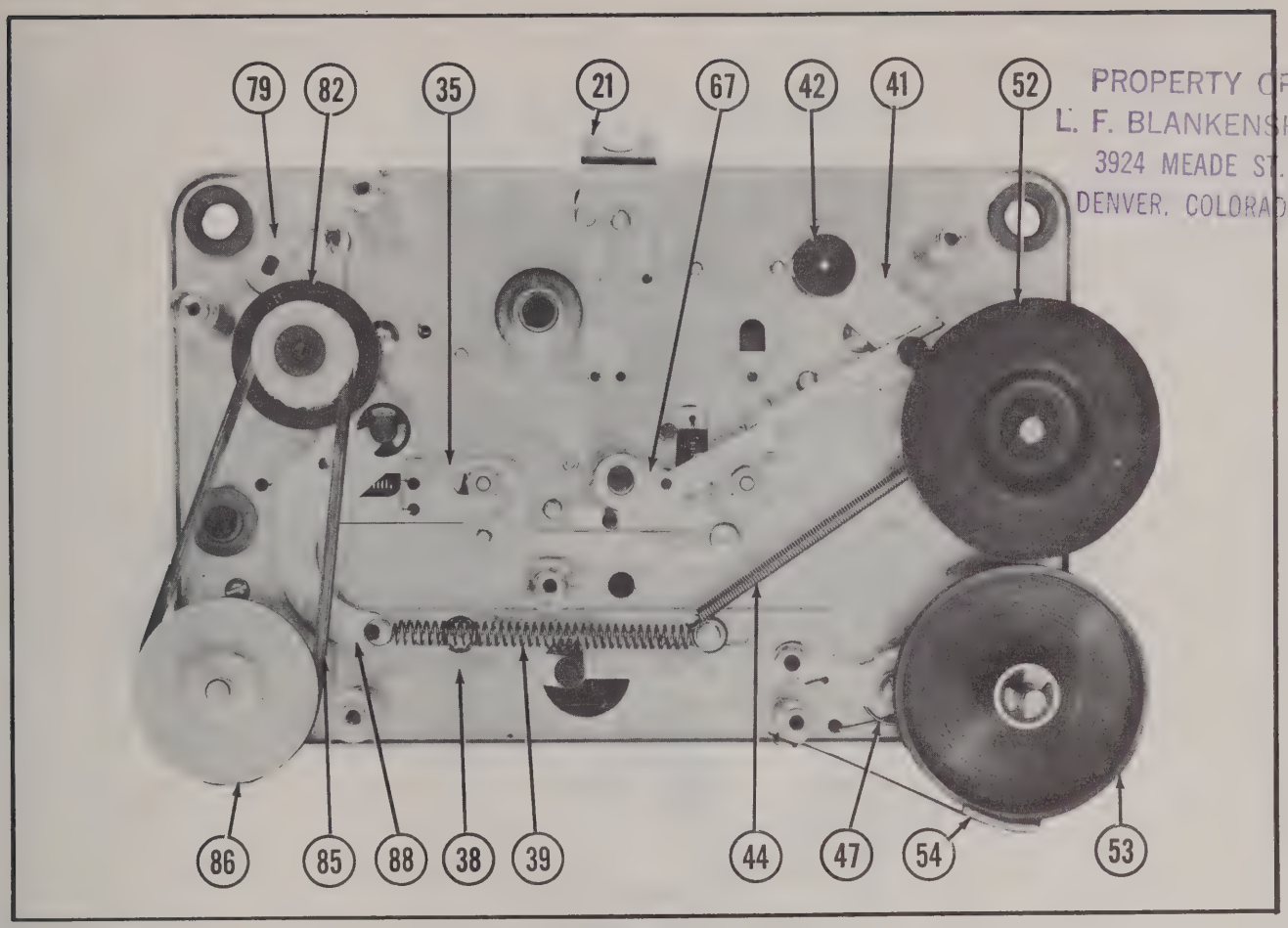

Figure 4

setting the height and output, check unit for track overlap. To do this, take a reel of tape that has no recording on it. Make a recording on the unit that the head has been adjusted on. Do not rewind but take the reel off, reverse them and play the other track. There should be no sound heard. If what was recorded is heard backwards then there is track overlap. If this is the case, recheck adjustments.

Supply Reel Drag Brake Adjustment-

The pressure of the drag brake pad (54) on the supply spindle should be about 40 grams measured with a string around a 2 1/4" reel hub. The hexagonal stud on which the flat spring drag brake (54) is mounted, can be rotated by loosening the lower screw to provide adjustment. Insufficient pressure can cause the tape to climb out from between the pressure roller and capstan or spill from the supply reel when going from forward to stop. Too much pressure may cause flutter.

Fast Forward Brake Adjustment-

The "Fast Forward" braRe (49) stops the supply spindle in the pause position and is disengaged in all other positions. The timing sequence between brake release and engagement of the fast forward pulley (86) and flywheel (69) during fast forward is provided by an eccentric roller on the brake bracket which can be rotated by unlocking the nut on the set screw and turning the screw in the appropriate direction.

The brake must release before the fast forward pulley engages the flywheel when going from pause to fast forward.

TROUBLES

Irregular Speed "Wow"-

1. Check capstan and pressure roller (12) for oil or foreign matter. Clean with cloth dipped in Carbon Tetrachloride while running. Check capstan and flywheel assembly (69) for freedom of rotation. If any binding is evident remove same and clean bearing areas on shaft and bearings with clean cloth. (Do not use Carbon Tetrachloride.) Wipe bearing areas with light wax free oil (instrument oil) before replacing.

2. Clean all drive surfaces-motor pulley idlers and flywheel with Carbon Tetrachloride. If idler pulley (52) is not properly engaging flywheel (69) and any indication of scrubbing is evident, replace idler assembly.

3. Check for excessive drag on tape caused by pressure pad on tape guide (23) See "Pressure Pad Adjustment".

4. Check for binds in supply reel shaft (25).

Tape Spillage-

1. Can be caused by glazed or dirty brake and drum surfaces.

2. A stretched take-up belt or brake adjustment may also be at fault. Glazed or dirty brake shoes can be scraped and cleaned with alcohol to restore their effectiveness.

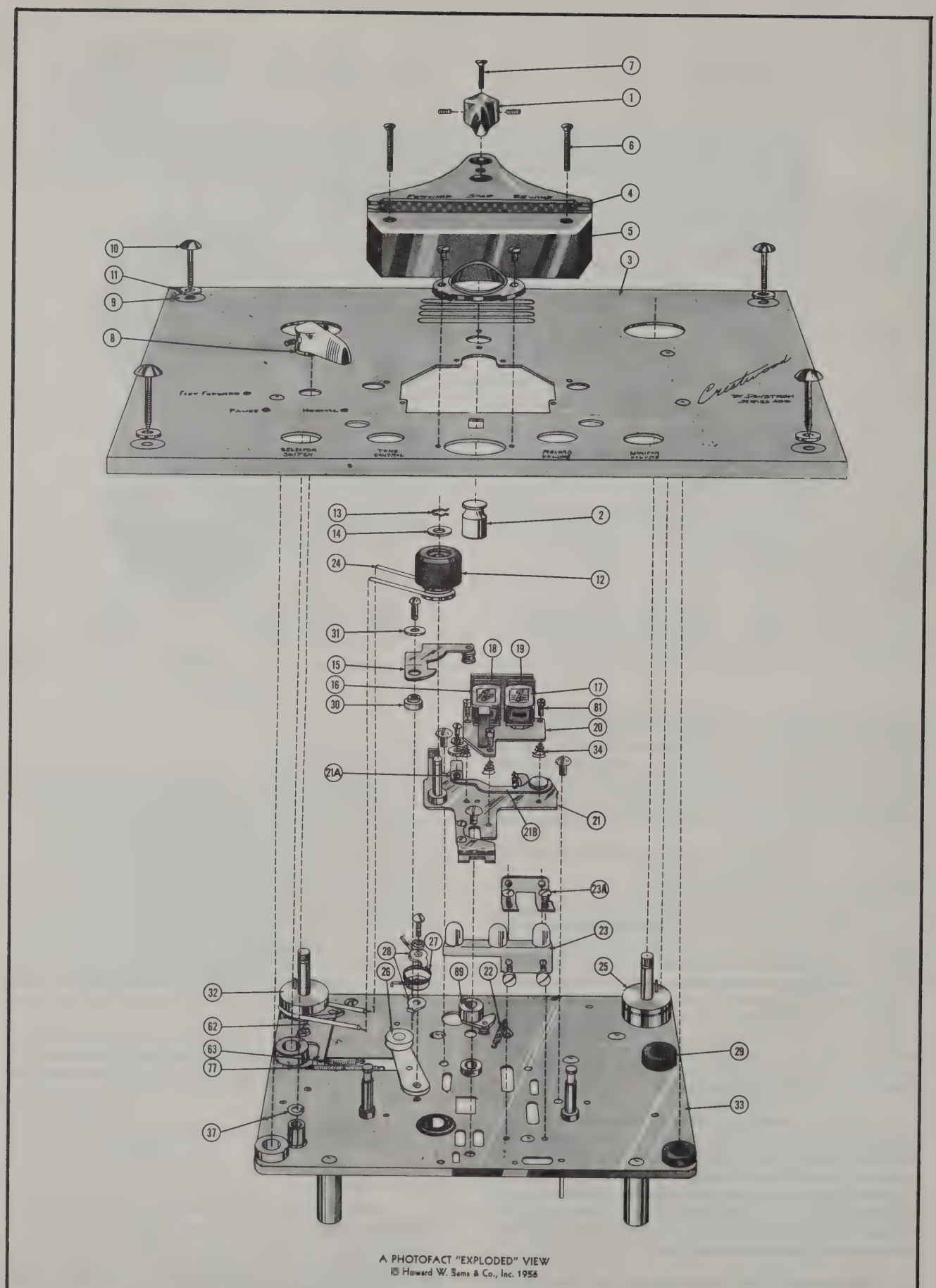

Figure 5A. Exploded View Of Parts Above Baseplate.

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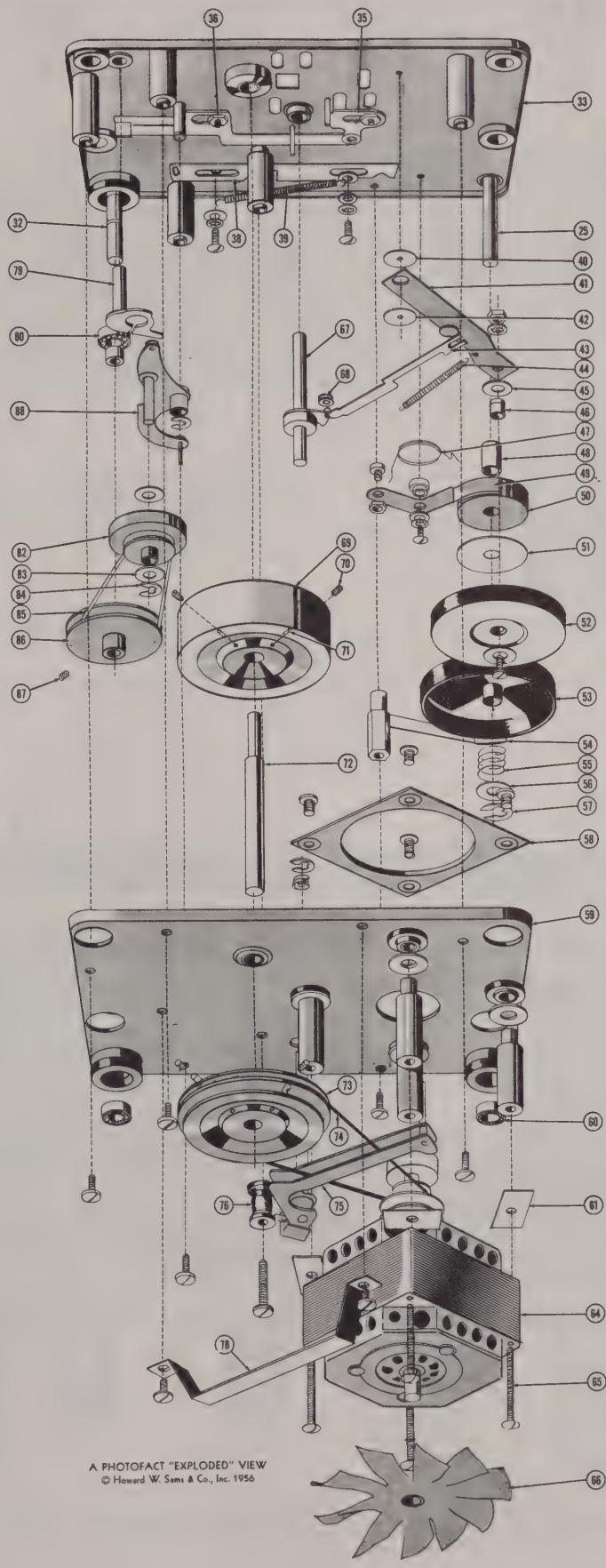
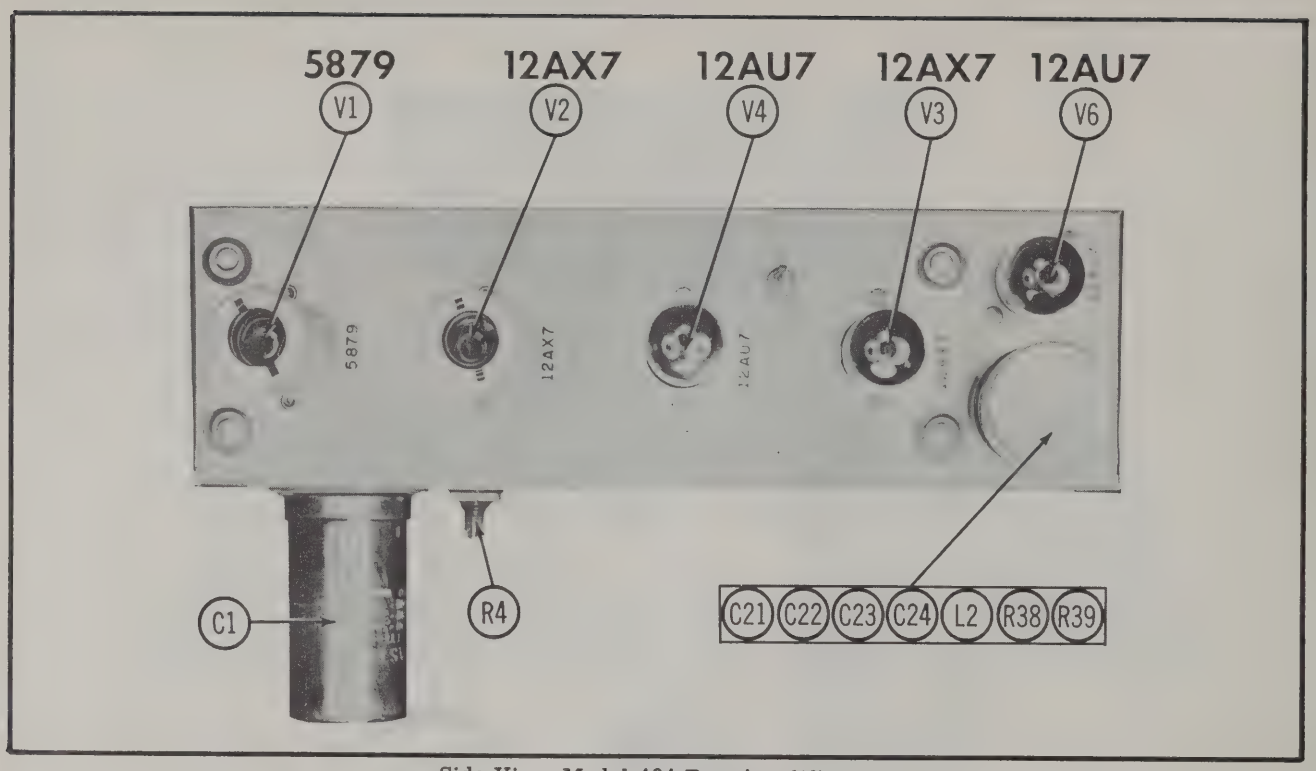
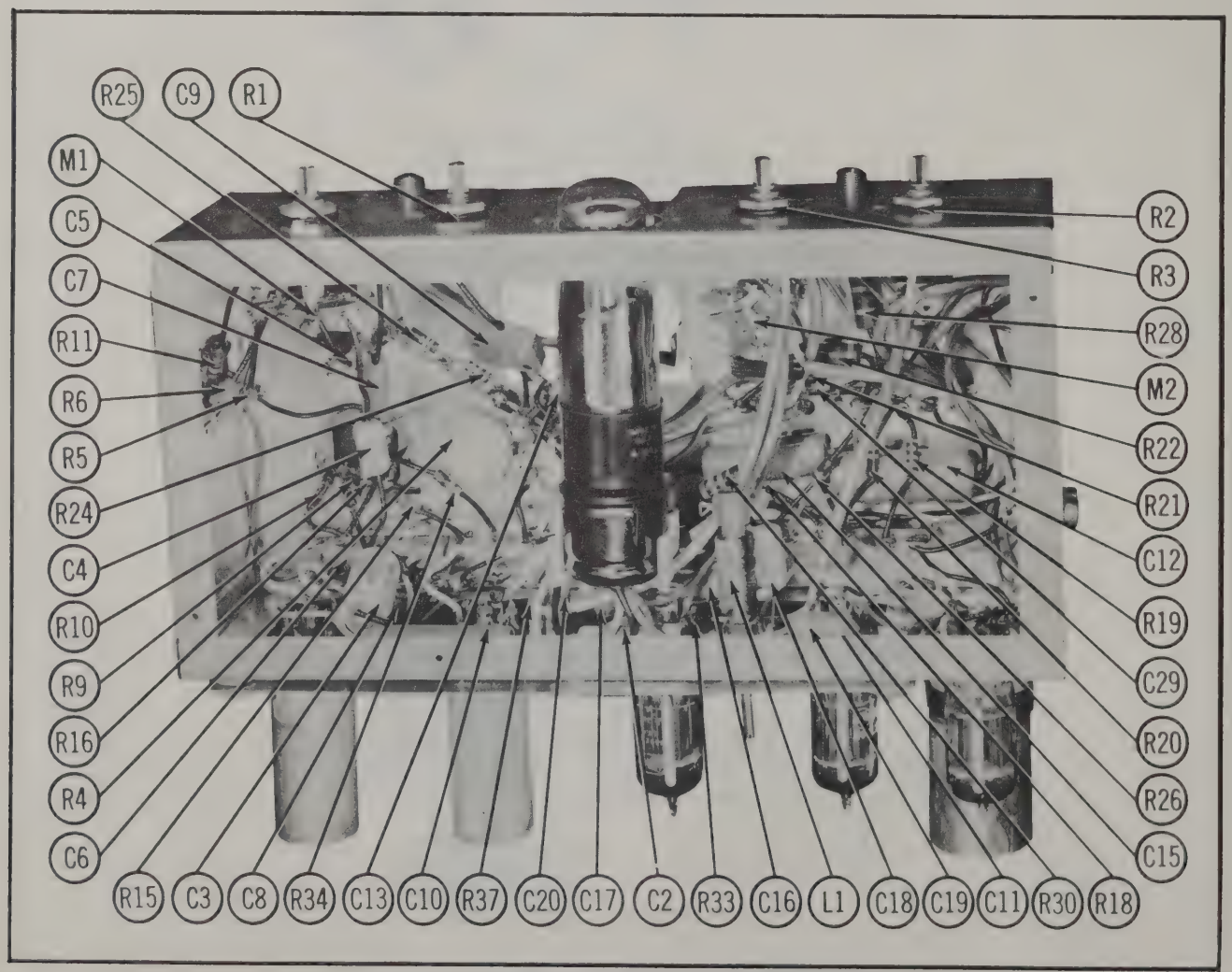


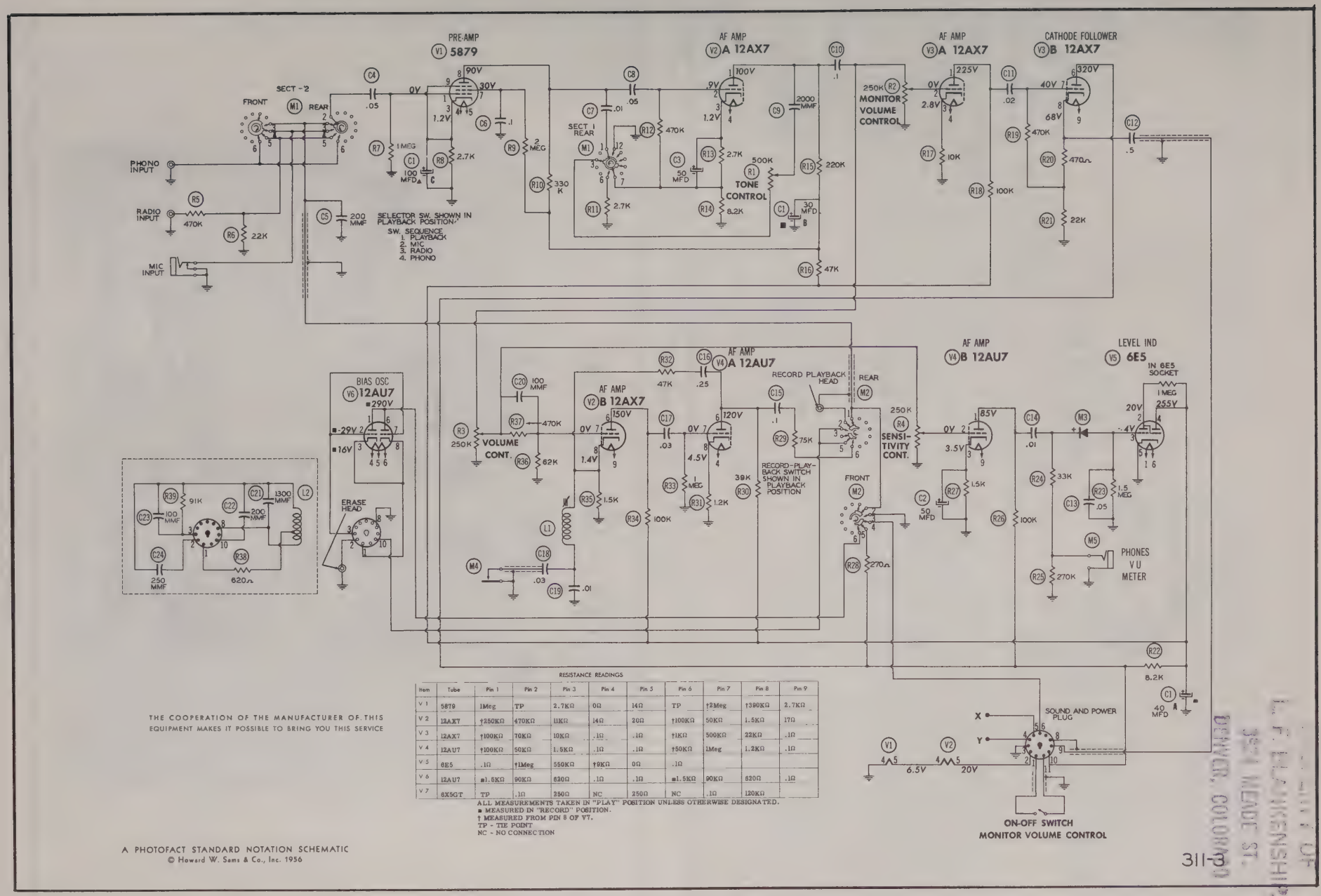
Figure 5B. Exploded View Of Parts Below Baseplate.



Side View-Model 404 Pre-Amplifier.



Bottom View-Model 404 Pre-Amplifier.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	5879	1Meg	TP	2.7KΩ	0Ω	14Ω	TP	†2Meg	†390KΩ	2.7KΩ
V 2	12AX7	†250KΩ	470KΩ	11KΩ	14Ω	20Ω	†100KΩ	50KΩ	1.5KΩ	17Ω
V 3	12AX7	†100KΩ	70KΩ	10KΩ	.1Ω	.1Ω	†1KΩ	500KΩ	22KΩ	.1Ω
V 4	12AU7	†100KΩ	50KΩ	1.5KΩ	.1Ω	.1Ω	†50KΩ	1Meg	1.2KΩ	.1Ω
V 5	6E5	.1Ω	†1Meg	550KΩ	†9KΩ	0Ω	.1Ω			
V 6	12AU7	■1.6KΩ	90KΩ	820Ω	.1Ω	.1Ω	■1.5KΩ	90KΩ	820Ω	.1Ω
V 7	6X5GT	TP	.1Ω	250Ω	NC	250Ω	NC	.1Ω	120KΩ	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
■ MEASURED IN "RECORD" POSITION.
† MEASURED FROM PIN 8 OF V7.
TP - TIE POINT
NC - NO CONNECTION

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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311-3

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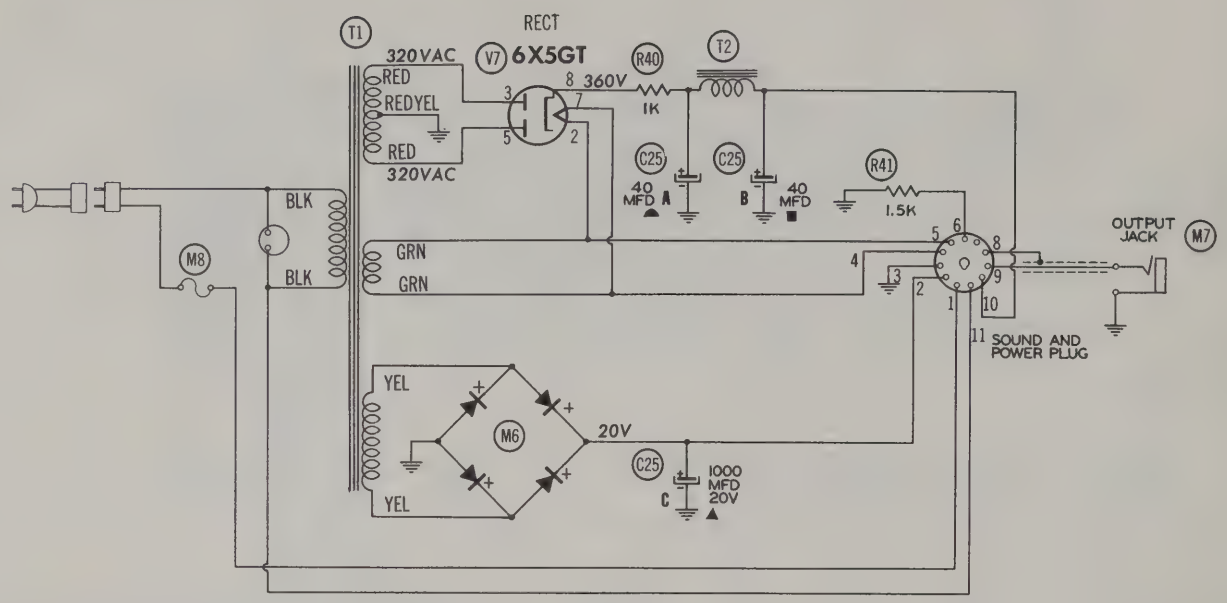
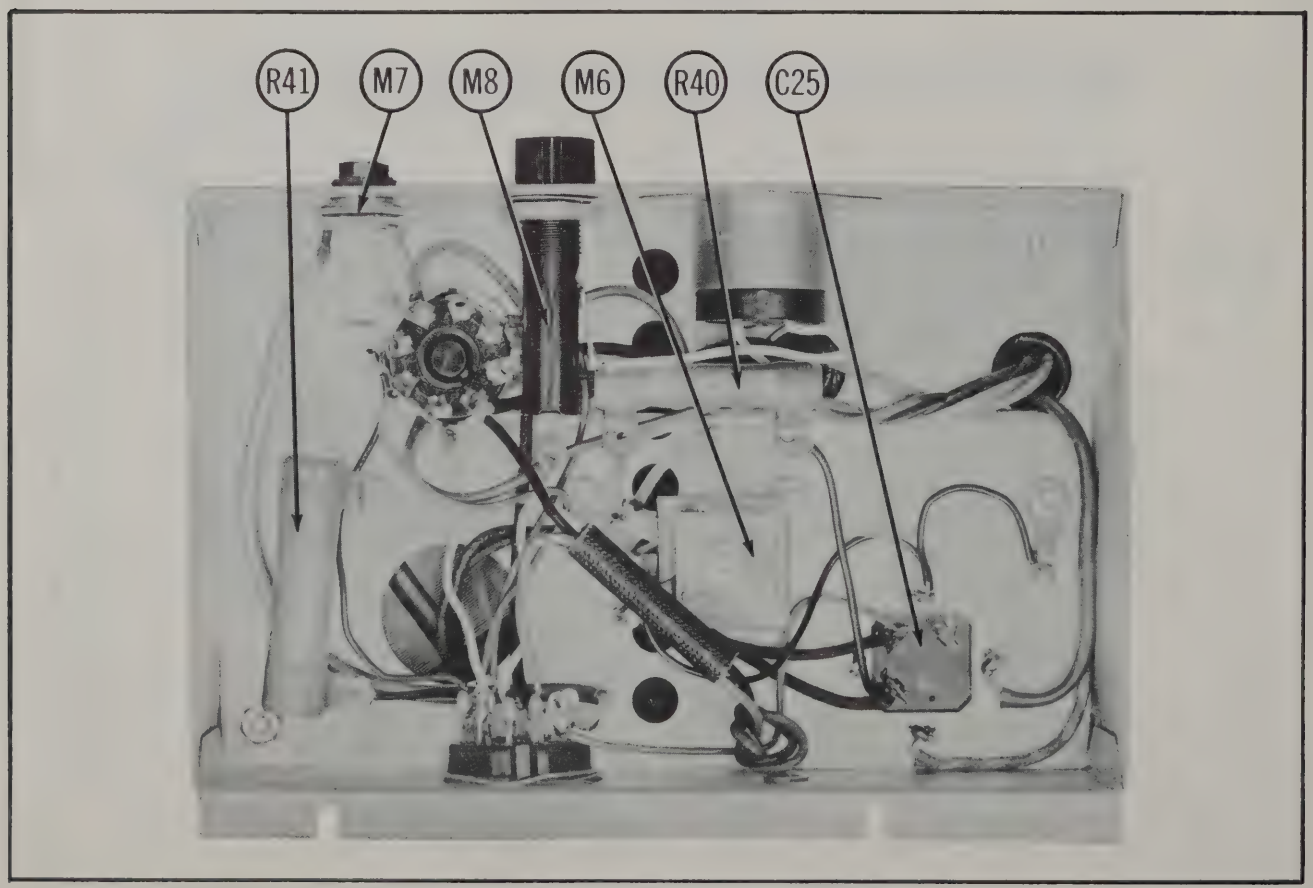
Pre Amplifier Schematic-Model 404



POWER SUPPLY SCHEMATIC



Bottom View-Model 404 Power Supply.

Erase And Bias Current-

The following current should be available at 65KC, measured by determining the voltage drop across a 100 ohm non-inductive resistor in the ground lead of the head.

1. Erase Current-6 to 8MA

2. Bias Current-. 6 to . 7MA

Erase Defective-

1. Head not properly aligned or head defective .

2. Too much oxide deposits on head should be cleaned with soft cloth and alcohol.

Motor Runs But Mechanism Will Not Operate-

1. Fast Forward control (8) in "Pause" position . Turn control to "Normal".

2. Take-up belt (24), fast forward drive belt (85) broken or off pulleys. Replace.

Slow Speed-

1. Machine has been exposed to low temperature . Allow machine to warm up to room temperature.

LUBRICATION

All moving parts of this recorder are in either sealed ball bearings, or self-lubricating oilite bearings. Additional lubrication should not be required except in cases of extreme use or replacement of parts. When lubricating, wipe bearing areas with light wax free oil (instrument oil).

CAUTION: Any excess oil may seep to the outer edges of moving parts and cause slippage in the drive mechanism. Should this occur, wipe off all parts thus affected with a soft cloth and Carbon Tetrachloride.

CLEANING

The majority of defects, other than wear or breakage, can be traced to dirty surfaces. The recording head (16), capstan, and pressure roller (12) are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts . This accumulation should be periodically removed since it may cause faint recordings and poor playback. Wipe off the above surfaces carefully with a clean cloth . If dirt is caked or hard and will not come off with a dry cloth, dampen cloth slightly with Carbon Tetrachloride.

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3924 MEADE ST
DENVER, COLORADO

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	1810	Forward — Reverse Knob	34	9040-485	Azimuth Heads Spring
2	9040-438	Speed Change Knob	35	9040-3	Detent Slide
3	3595	Control Panel Assembly	36	9040-69	Shoulder Nut
4	1793	Head Cover	37	9040-222	Truarc (For 1/4" Shaft)
5	1792	Main Cover	38	9040-327	Brake Bar
6	1413	Main Cover Mounting Screw	39	9040-71	Slide Bar Spring
7	1463	Cover Mtg. Screw	40	9040-434	Rewind Idler Washer
8	1805	Fast Forward Control Knob	41		Rewind Idler Lever
9	1400	Grommet	42	9040-433	Rewind Idler Shoulder Nut
10	1465	Panel Mtg. Screw	43		Lever (Part of Item 67)
11	1403	Control Panel Screw Washer	44	9040-473	Rewind Idler Spring
12	9040-271	Pressure Roller Assembly	45	9040-429	Washer
13	9040-148	Hairpin Spring	46	9040-431	Spacer
14	9040-146	Fibre Washer	47	9040-82	Fast Forward Brake Spring
15	9040-182	Pressure Release Lever Assy.	48	9040-441	Spacer
16	2000	Record Head	49	9040-492	Brake
17	2001	Erase Head	50	9040-385	Clutch Disc
18	9040-161	Record Head Bracket	51	9040-418	Felt Clutch
19	9040-161	Erase Head Bracket	52	9040-428	Idler Wheel
20	9040-2	Head Mounting Bracket	53	9040-390	Clutch Pulley Assy.
21	9040-350	Pressure Roller Slide Plate Assy.	54	9040-424	Impedance Arm Assy.
21A		Arm Adjusting Plate	55	9040-487	Clutch Spring
21B		Pressure Arm	56	9040-452	Washer
22	9040-76	Pressure Arm Spring	57	9040-121	"E" Ring
23	9040-399	Tape Guide Assy.	58	9040-405	Motor Plate
23A		Tape Guide Mounting Screw	59		Lower Mechanism Plate
24	9040-270	Flat Belt	60	9040-360	Ball Bearing — Reel Spindle
25	9040-465	Right Spindle Assy.	61		Spacer
26	9040-292	Take Up Idler Assy.	62	9040-338	Rewind Brake Assy.
27	9040-391	Take Up Idler Spring	63	9040-88	Rewind Brake Spring
28	9040-29	Take Up Idler Stop	64	9040-389	Motor Assy.
29	9040-90	Grommet	65		Screw
30	9040-64	Pressure Release Lever Button	66	9040-367	Fan
31	9040-120	Cup Washer	67	9040-456	Control Shaft Assy.
32	9040-464	Left Spindle Assy.	68	9040-46	Cam Roller
33		Upper Mechanism Plate	69	9040-406	Flywheel

MECHANICAL PARTS LIST (Cont.)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
70	9040-467	Set Screw	80	9040-360	Ball Bearing – Reel Spindle
71	9040-455	Set Screw Plug	81	9040-214	Socket Head Screw
72	9040-303	Capstan Shaft	82	9040-193	Fast Forward Pulley Assy.
73	9040-304	Flywheel Pulley	83	9040-251	Washer
74	9040-470	Capstan Drive Belt	84	9040-123	"E" Ring
75	9040-457	Change Arm Assy.	85	9040-48	Fast Forward Belt
76	9040-437	Speed Change Detent	86	9040-443	Fast Forward Pulley Spindle
77	9040-83	Detent Slide Spring	87	9040-467	Set Screw
78	9040-410	Capstan Bracket	88	9040-495	Fast Forward Assy.
79	9040-412	Fast Forward Cam Shaft Assy.	89	9040-189	Cam And Bushing Assy.

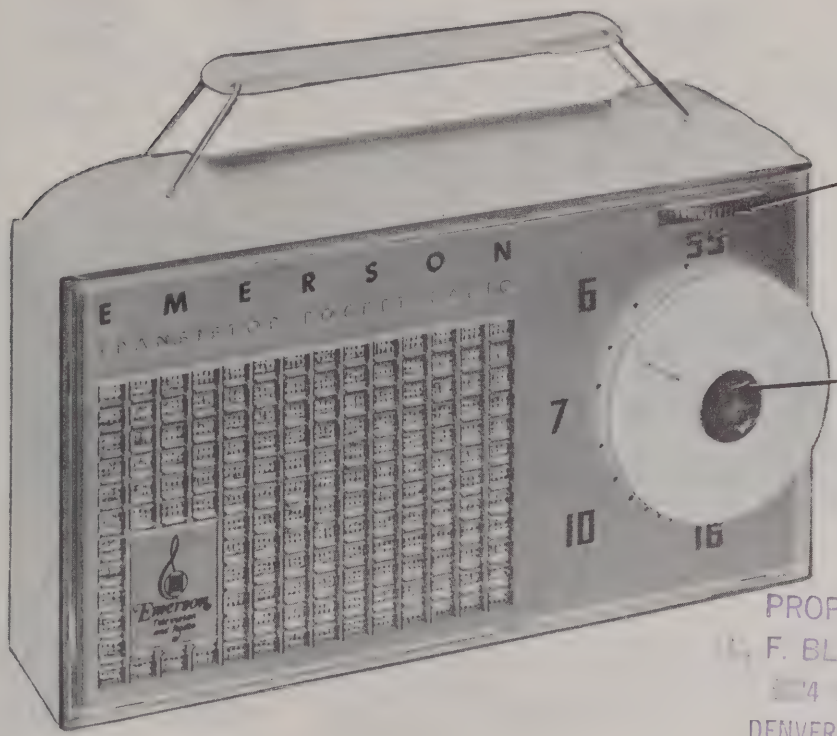
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	1002	5879 Pre-Amplifier	R7	13	Resistor, 1Meg, 1/2 W.
V2	1004	12AX7 AF Amplifier	R8	57	Resistor, 2. 7K, 1/2 W.
V3	1004	12AX7 AF Amplifier & Cathode Follower	R9	58	Resistor, 2Meg, 1/2 W.
			R10	59	Resistor, 330K, 1/2 W.
V4	1000	12AU7 AF Amplifier	R11	2	Resistor, 2700, 1/2 W.
V5	1001	6E5 Record Level Indicator	R12	1	Resistor, 470K, 1/2 W.
V6	1000	Bias Oscillator	R13	2	Resistor, 2700, 1/2 W.
C1A	350	Elect. Cap., 40MFD. @300V.	R14	52	Resistor, 8. 2K, 1/2 W.
C1B		Elect. Cap., 30MFD. @250V.	R15	50	Resistor, 220K, 1/2 W.
C1C		Elect. Cap., 100MFD. @25V.	R16	12	Resistor, 47K, 1/2 W.
C2	356	Elect. Cap., 50MFD. @6V.	R17	4	Resistor, 10K, 1/2 W.
C3	356	Elect. Cap., 50MFD. @6V.	R18	9	Resistor, 100K, 1/2 W.
C4	214	Cap. Paper, .05MFD @200V.	R19	1	Resistor, 470K, 1/2 W.
C5	200	Cap. Mica, 200MMF. @200V.	R20	61	Resistor, 470KΩ, 1/2 W.
C6	208	Cap. Paper, .1MFD. @400V.	R21	18	Resistor, 22K, 1/2 W.
C7	210	Cap. Paper, .01MFD. @400V.	R22	21	Resistor, 8. 2K, 2W.
C8	214	Cap. Paper, .05MFD. @200V.	R23	60	Resistor, 1. 5Meg, 1/2 W.
C9	211	Cap. Mica, 2000MMF @500V.	R24	38	Resistor, 33K, 1/2 W.
C10	216	Cap. Paper, .1MFD @400V.	R25	10	Resistor, 270K, 1/2 W.
C11	213	Cap. Paper, .02MFD @400V.	R26	9	Resistor, 100K, 1/2 W.
C12	220	Cap. Paper, .5MFD @400V.	R27	11	Resistor, 1500Ω, 1/2 W.
C13	214	Cap. Paper, .05MFD @200V.	R28	47	Resistor, 270Ω, 2 W.
C14	210	Cap. Paper, .01MFD @400V. (Some Units . 05MFD. In This Application)	R29	16	Resistor, 75K, 1/2 W.
			R30	15	Resistor, 39K, 1 W.
C15	208	Cap. Paper, .1MFD. @400V.	R31	14	Resistor, 1200Ω, 1/2 W.
C16	218	Cap. Paper, .25MFD. @400V.	R32	12	Resistor, 47K, 1/2 W.
C17	207	Cap. Paper, .03MFD. @400V.	R33	13	Resistor, 1Meg, 1/2 W.
C18	207	Cap. Paper, .03MFD. @400V.	R34	9	Resistor, 100K, 1/2 W.
C19	221	Cap. Paper, .01MFD. @400V.	R35	11	Resistor, 1500Ω, 1/2 W.
C20	205	Cap. Mica, 100MMF @500V.	R36	42	Resistor, 62K, 1/2 W.
C21	228	Cap., 1300MMF @500V.	R37	1	Resistor, 470K, 1/2 W.
C22	229	Cap., 200MMF. @500V.	R38	44	Resistor, 620Ω, 1 W.
C23	227	Cap., 100MMF. @500V.	R39	43	Resistor, 91K, 1/2 W.
C24	226	Cap., 250MMF. @500V.	L1	1253	Tone Compensation Coil
R1	654	Tone Control, 500KΩ	L2	1254	Bias Oscillator Coil
R2	651	Monitor Volume, 250KΩ	M1	451	Selector Switch
R3	650	Record Volume, 250KΩ	M2		Play Record Switch
R4	650	Sensitivity Control, 250KΩ	M3	1101	Germanium Diode
R5	1	Resistor, 470K, 1/2 W.	M4	453	Equalizer Switch
R6	2	Resistor, 2700, 1/2 W.	M5	551	Phones, VU Meter Jack

POWER SUPPLY PARTS LIST
Crestwood Model 404

Ref. No.	Part No.	Description-	Ref. No.	Part No.	Description
V7	1006	6X5GT, Rectifier	R41	37	Resistor, 1. 5K, 20W.
C25A	351	Elect. Cap., 40MFD. @400V.	T1	1150	Power Transformer
C25B		Elect. Cap., 40MFD. @400V.	T2	1200	Filter Choke
C25C		Elect. Cap., 1000MFD. @20V.	M6	1100	Selenium Rectifier
R40	64	Resistor, 1000Ω, 10W.	M7	551	Output Jack
			M8	555	Fuse Holder

EMERSON MODEL
838 (Ch. 120274)



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EMERSON MODEL
838 (Ch. 120274)

TRADE NAME	Emerson Model 838 (Ch. 120274)
MANUFACTURER	Emerson Radio & Phonograph Corp., 14th. & Colss St., Jersey City 2, N.J.
TYPE SET	Battery Operated Portable AM Superheterodyne Receiver
TUBES (Five)	Types 1V6 Converter, 1AH4 IF Amp., 1AJ5 Det.-AVC-AF Amp., Transistors (2) part #815003 Output
POWER SUPPLY	4 Volts "A" Supply & 45 Volts "B" Supply RATING 50MA @ 4 Volts DC & 2.5MA @ 45 Volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 3 (grid) of 1V6 (V1). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop (Radiated)	1640KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
4.		"	600KC	Tune to 600KC signal	"	A7	"

DISASSEMBLY

1. Remove "A" and "B" batteries.
2. Remove screw from center of tuning knob. Remove knob.
3. Insert finger in "B" battery opening and gently apply pressure to inside of front cover until it releases. Remove cover.
4. Slide chassis toward the "B" battery opening.
5. Lift chassis straight up. Do not strain the leads connected to the chassis.

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PARTS LIST AND DESCRIPTIONS

EMERSON
MODEL 838 (Ch. 120274)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		EMERSON PART No.	STANDARD REPLACEMENT	
V1	Converter	1V6	1V6	
V2	IF Amplifier	1AH4	1AH4	
V3	Det.-AVC-AF Amplifier	1AJ5	1AJ5	

TRANSISTORS

ITEM No.	USE	REPLACEMENT DATA		NOTES
		EMERSON PART No.	STANDARD REPLACEMENT	
X1	Audio Output	815003		Available only and must be replaced only in matched pairs
X2	Audio Output	815003		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	8	50	925238	SRE50V10	BBR10-50	TC32		MMT-0510	TVA-1304
C2	50	6	925310	SRE6V50	BBR50-6			MMT-650	TVA-1100

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.022	200	920557	BPD-02	DD-203	K085	817-02	PT4122	5HK-S2	
C4	5		928088	NP0-DI5	TCZ-4R7	Z011	NP0A-050	ZT-555	5TCCB-V47	
C5	.047	100	920690	BPD-05	DF-503					
C6	.047	100	920690	BPD-05	DF-503					
C7	2000		928094	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C8	5		928088	NP0-DI5	TCZ-4R7	Z011	NP0A-050	ZT-555	5TCCB-V47	
C9A	200									
B	1000									
C	100		923029							
D	10000									
C10	50000		928149	BPD-05	DF-503					

CONTROLS

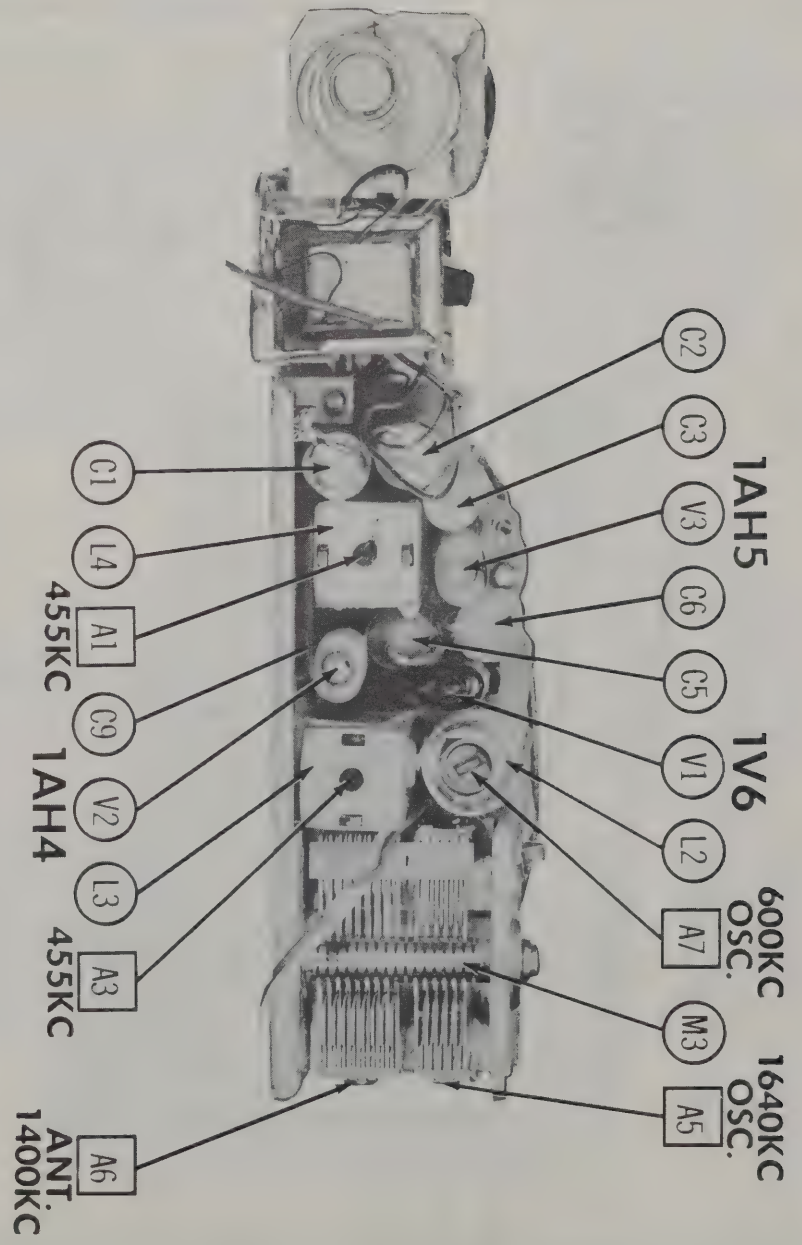
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1Meg	½	390223	B16-120				Volume

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R2	4.7Meg	½	351375	BTS-4.7Meg	
R3	4.7Meg	½	351375	BTS-4.7Meg	
R4	1Meg	½	341215	BTS-1Meg	
R5	10Meg	½	351455	BTS-10Meg	
R6	100KΩ	½	350975	BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R7	5.6Meg	½	341395	BTS-5.6Meg	
R8	220KΩ	½	351055	BTS-220K	
R9	2700Ω	½	340595	BTS-2700	
R10	120Ω	½	340275	BTS-120	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (INPUT)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	2.27KΩ RES.	3.16Ω CT RES.			734112					

TURNS RATIO 1 TO 9.1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	500Ω CT	16.4Ω	734113						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	QUAM PART No.	RCA TYPE No.	
SP1	2 3/4"	PM	16.4Ω	180130		222S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.9Ω		700085				
L2	Osc. Coil	1.9Ω	9Ω	716095				
L3	Input IF	20Ω	20Ω	720189	16-6800		10-C1	
L4	Output IF	20Ω	20Ω	720189	16-6801		10-C2	

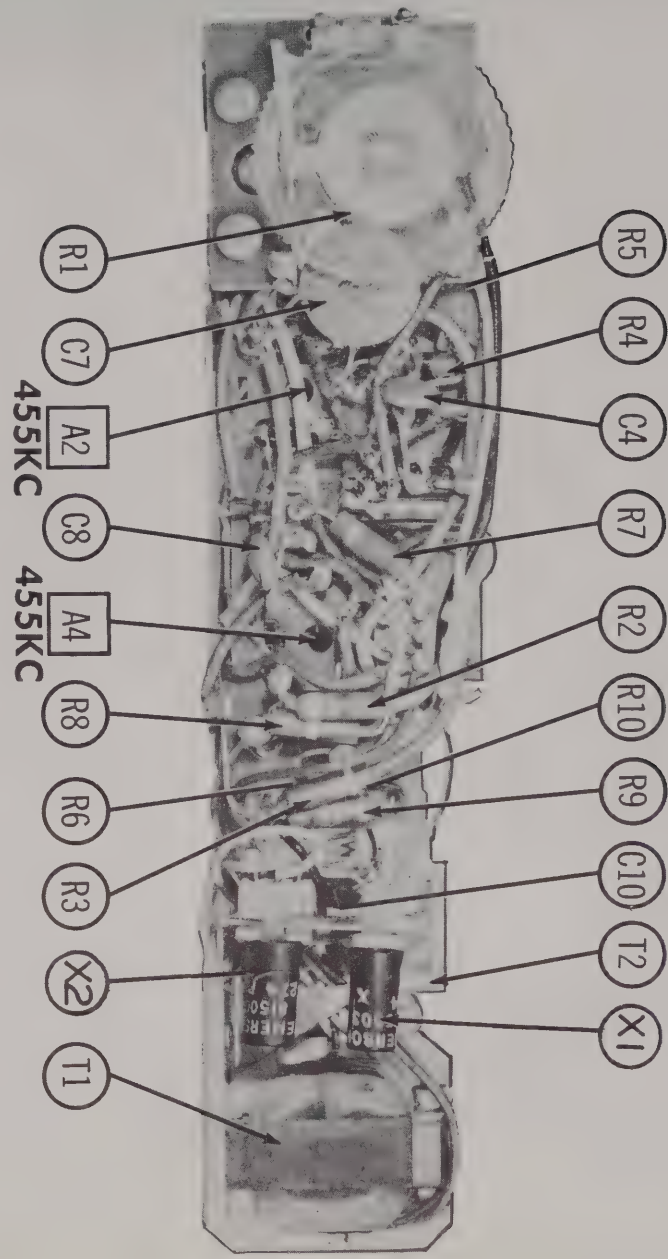
BATTERIES

ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	4V "A"	818113	E-233						
M2	45V "B"	818110		415			U30		

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuning Cap.	900101	2 Gang
M4	Switch	960752	On-off
	Cabinet Case	140511	Specify color
	Cabinet Front	140705	Specify color
	"A" Battery Door	961186	Specify color
	"B" Battery Door	460406	Specify color
	Handle	460486	
	Knob	460429	Tuning - specify color
	Knob	960754	Volume and switch actuator

CHASSIS—BOTTOM VIEW



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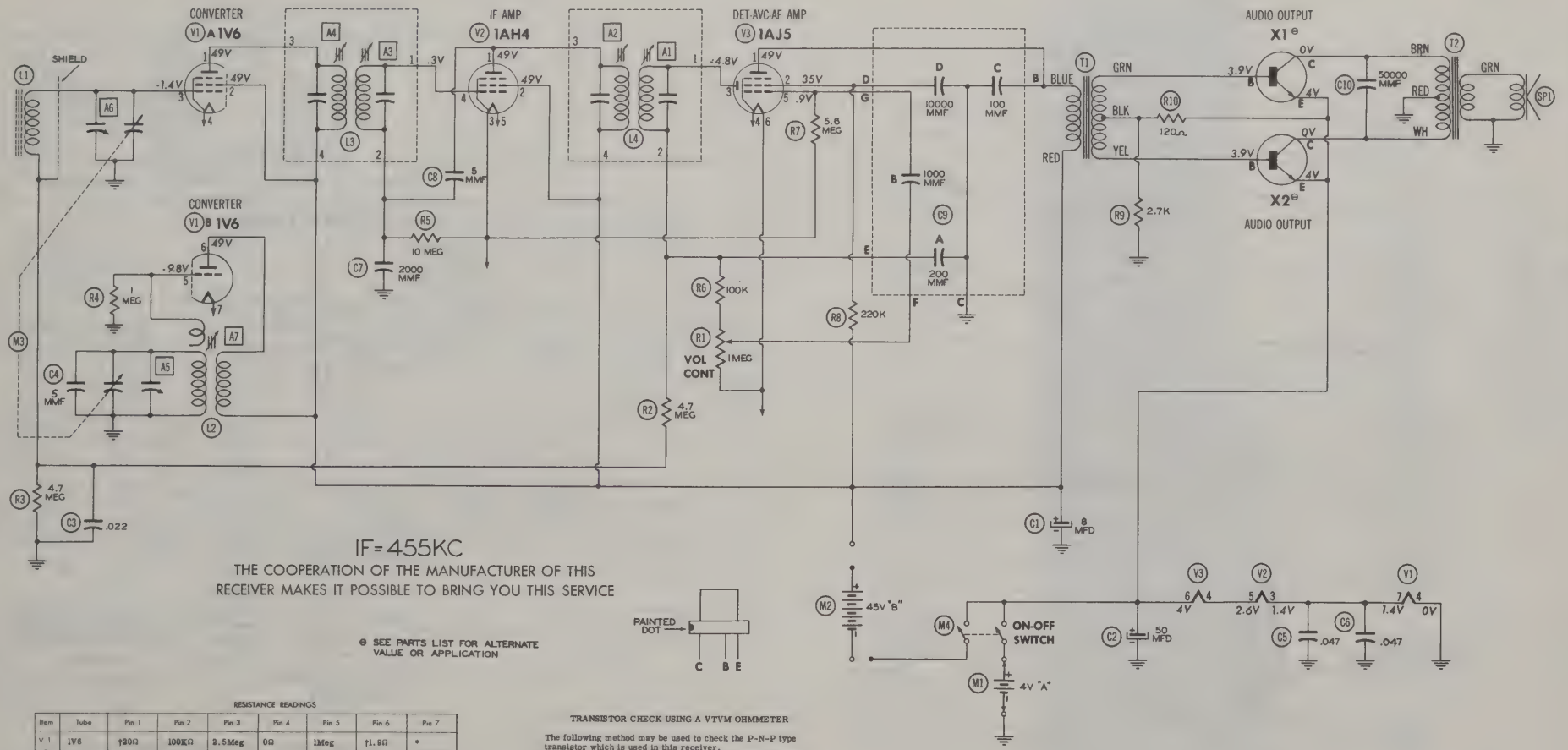
EMERSON
MODEL 838 (Ch. 120274)



IF = 455KC

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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1V6	†20Ω	100KΩ	2.5Meg	0Ω	1Meg	†1.9Ω	*
V 2	1AH4	†20Ω	100KΩ	*	10Meg	*		
V 3	1AJ5	†2.3KΩ	†220KΩ	1Meg	*	5.6Meg	*	
		Base	Emitter	Collector				
X1	Transistor	44Ω	40Ω	8.4Ω				
X2	Transistor	44Ω	40Ω	8.4Ω				

† MEASURED FROM POSITIVE SIDE OF C1.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

TRANSISTOR CHECK USING A VTVM OHMMETER

The following method may be used to check the P-N-P type transistor which is used in this receiver.
CAUTION: Use only a VTVM ohmmeter and connect a 1000Ω resistor in series with either lead.
1. Set meter switch to RX10 position.
2. Connect one meter lead to the base - connect the other meter lead to the collector. Note meter reading.
3. Reverse meter leads. Note meter reading.
4. After subtracting the 1000Ω series resistance initially added, one reading should be 500Ω or lower, the other reading, 50000Ω or higher.

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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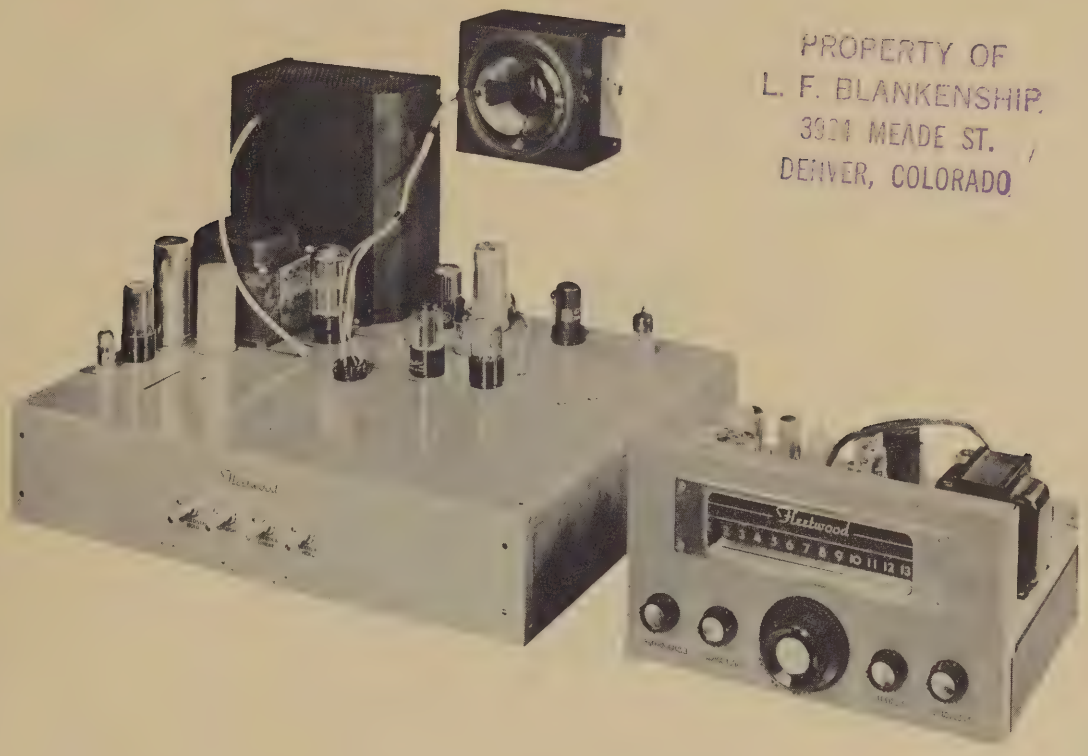

FLEETWOOD
MODEL 800

TRADE NAME	Fleetwood Model 800
MANUFACTURER	Conrac, Inc., Glendora, Calif.
TYPE SET	Television Receiver
TUBES	Twenty-eight
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Horizontal Sweep Circuit Adjustments 17
Parts List and Descriptions ..... 11 thru 14
Photographs
Capacitor Identification (RF-IF Chassis) 15
Capacitor Identification (Sweep Chassis) 4
Chassis-Top View (RF-IF Chassis) 3
Chassis-Top View (Sweep Chassis) 3
High Voltage Comparment 17
RF Tuner 17
Resistor Identification (RF-IF Chassis) 15
Photographs (Cont)
Resistor Identification (Sweep Chassis) 9
Trans., Inductor & Alignment Ident. (RF-IF Ch.) 10
Trans., Inductor & Alignment Ident. (Sweep Ch.) 10
Resistance Measurements 8
Servicing in the Field 1
Schematic 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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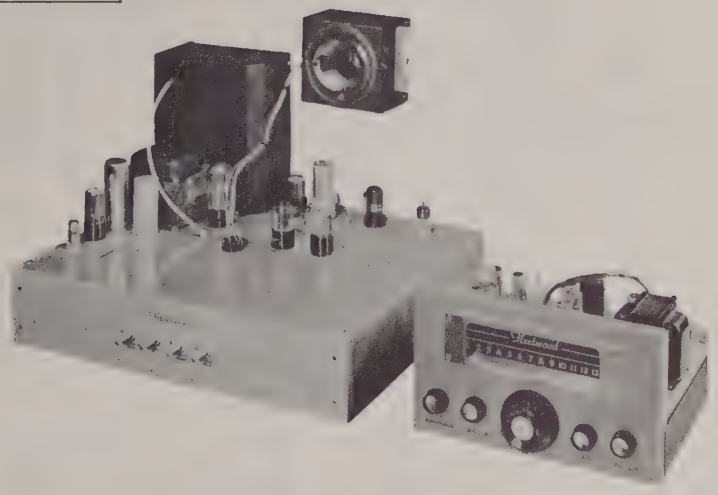
DISASSEMBLY INSTRUCTIONS

This receiver is designed for custom installation and therefore, chassis removal is depended up on type and place of mounting employed.



FLEETWOOD MODEL 800

FLEETWOOD
MODEL 800

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the chassis. Adjustment is located on top of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug (L27) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L23) located on top of the chassis.

FUSES

Two fuses are used. One for LV power supply protection (RF-IF Chassis), and one for LV power supply protection (Sweep Chassis) (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

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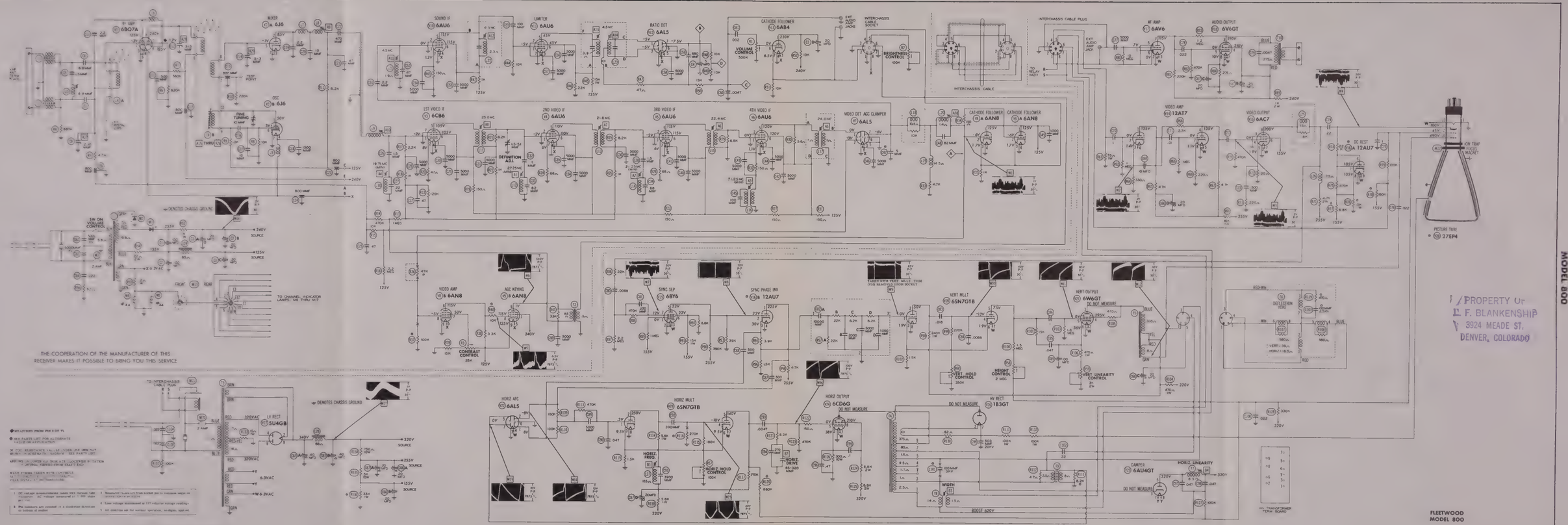

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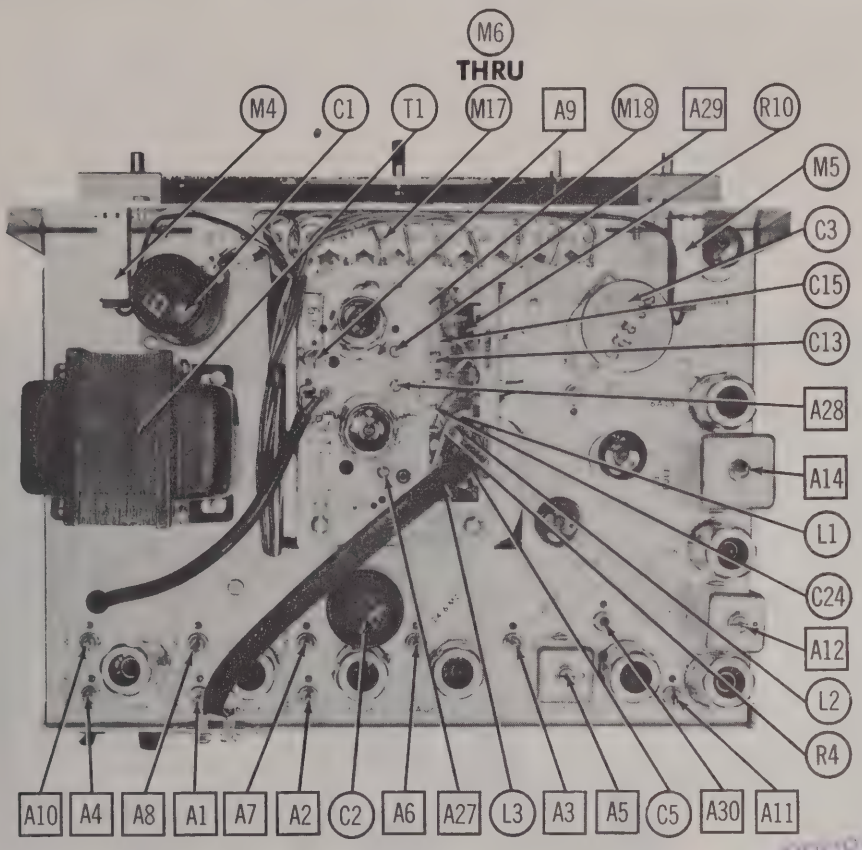
FLEETWOOD MODEL 800

FLEETWOOD MODEL 800



RF-IF CHASSIS-TOP VIEW

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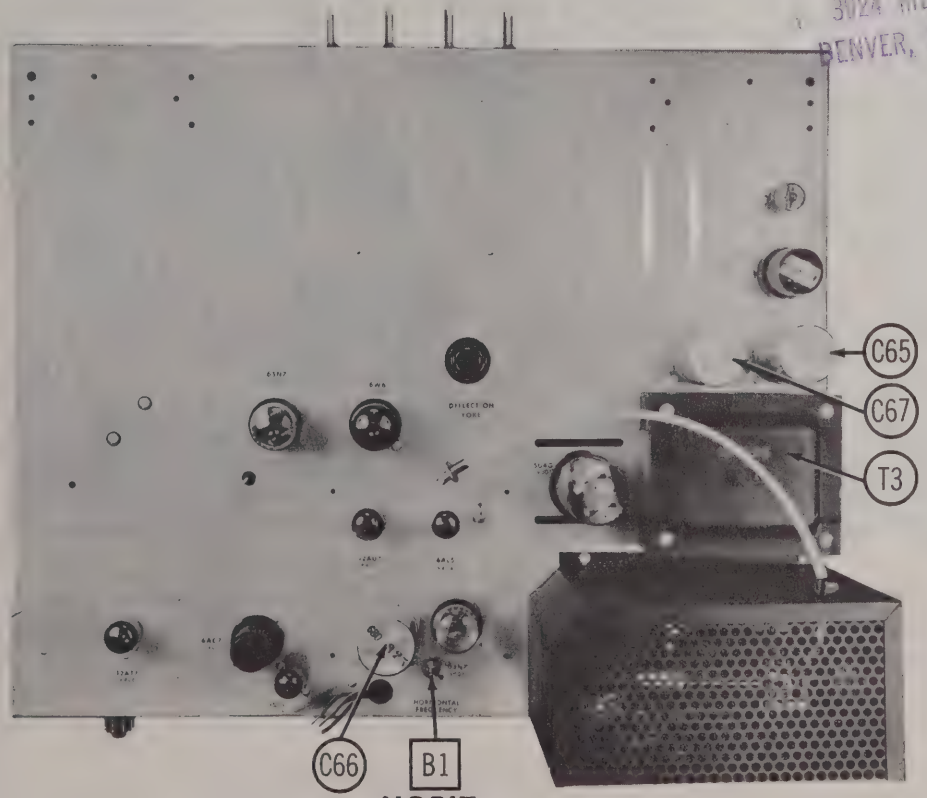
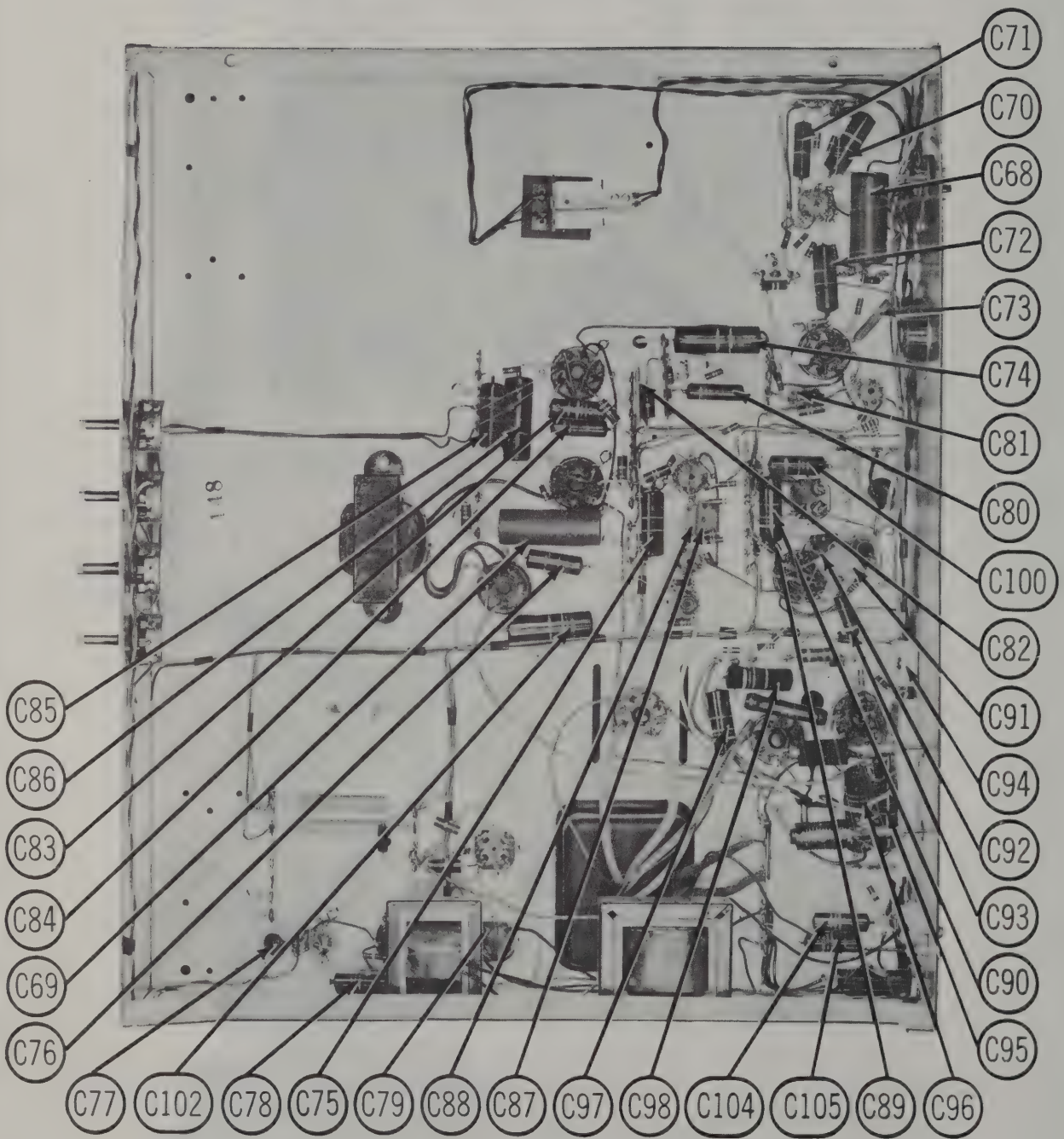
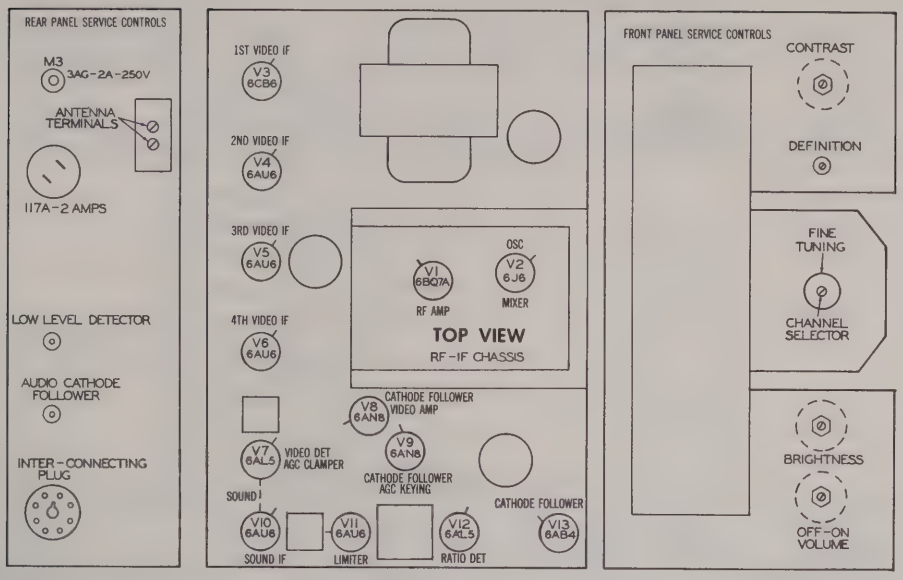


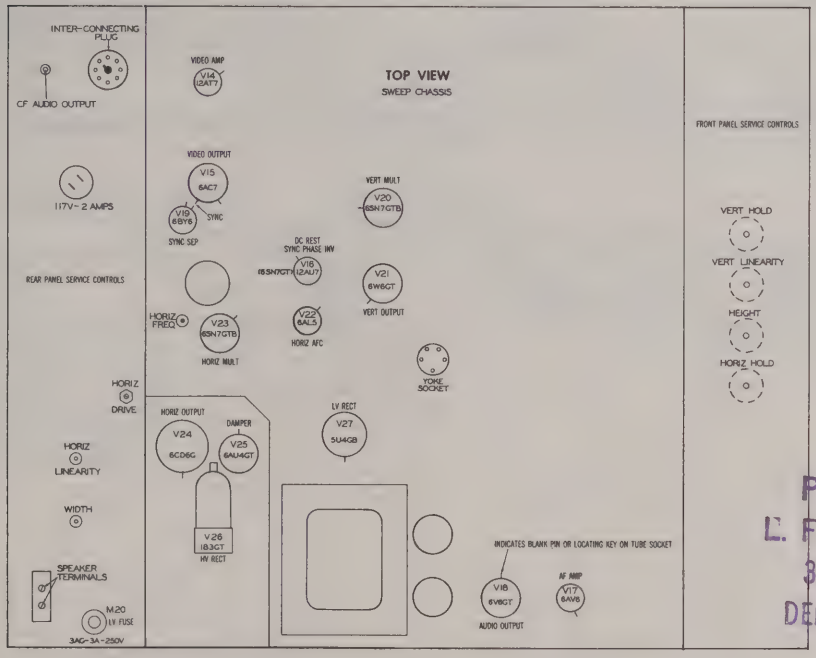
SWEEP CHASSIS-TOP VIEW



SWEEP CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART





FLEETWOOD MODEL 800

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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2), V27, Fuses (M3 & M20), Relay (M21)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V7**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V8, V9, V14, V15, V28**
Has pic, no sound - **V10, V11, V12, V13, V17, V18**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V16, V20**
No horiz. sync - **V16, V22, V23**
No vert. or horiz. sync - **V16, V19**

SWEEP FAILURE
No raster, has sound - **V23, V24, V25, V26, V28**
No vertical deflection - **V20, V21**
Poor vert. linearity or foldover - **V20, V21**
Poor horiz. linearity or foldover - **V23, V24, V25**
Narrow picture - **V23, V24, V25, V26, V27**
Vert. off freq. - **V16, V20**
Horiz. off freq. - **V16, V22, V23**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage should be securely taped away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has had pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications. Connect the negative lead of a 3 volt bias supply to the ungrounded side of C37. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	27.25MC	Any	DC probe to point ◇A. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	21.25MC	"	"	A2	"
3.	"	"	21.25MC	"	"	A3	"
4.			19.75MC	"	"	A4	
5.	"	"	24MC	"	"	A5	Adjust for maximum deflection. Attenuate generator output to maintain not more than -1.5 volts at VTVM.
6.	"	"	22.4MC	"	"	A6	"
7.	"	"	21.6MC	"	"	A7	"
8.	"	"	25MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp.)	19.75MC 21.25MC 22MC 23.7MC 25.75MC 27.25MC	Any	Vert. Amp. thru 10KΩ to point ◇A. Low side to chassis.	A9, A10	Check for response similar to Fig. 1. Adjust A9 until dip in response curve is centered about the 23.7MC marker. If necessary, retouch A5 thru A8 to obtain desired response. Adjust A10 for maximum amplitude.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (grid) of 6AU6 (V10). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point ◇B. Common to chassis.	A11, A12, A13	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point ◇C. Common to point ◇D.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (grid) of 6AU6 (V10). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point ◇B. Low side to chassis.	A11, A12, A13	Disconnect stabilizer capacitor C4. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
11.	"	"	"	"	"	Vert. Amp. to point ◇C. Low side to chassis.	A14	Reconnect stabilizing capacitor C4. Adjust A13 so that 4.5MC marker occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

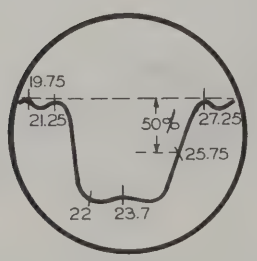

FIG. 1

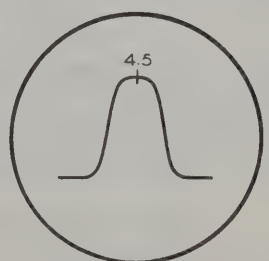

FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket. Leave the bias connected as under "Video IF Alignment". The channel oscillator adjustment screws are reached through a hole above and slightly to the left of the channel selector shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205. 25MC 209. 75MC	12	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			213MC (10MC Swp.)	211. 25MC 215. 75MC	13		A16	
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11		A17	
			195MC (10MC Swp.)	193. 25MC 197. 75MC	10		A18	
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9		A19	
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8		A20	
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7		A21	
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6		A22	
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5		A23	
			69MC (10MC Swp.)	67. 25MC 71. 75MC	4		A24	
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3		A25	
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2		A26	

RF AND MIXER ALIGNMENT

Leave the bias connect as under "Video IF Alignment". Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205. 25MC 209. 75MC	12	Vert. Amp. to point (A). Low side to chassis.	A27, A28, A29	Adjust for maximum amplitude and MINIMUM tilt with markers in proper positions as in Fig. 4.

4.5MC TRAP ALIGNMENT

Tune in a TV station and turn the fine tuning control clockwise until 4.5MC beat appears in the picture. Adjust A30 for MINIMUM 4.5MC beat interference.

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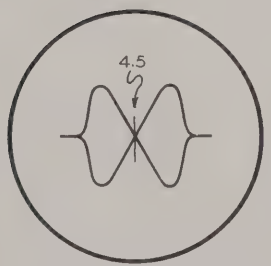


FIG. 3

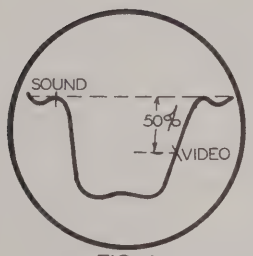
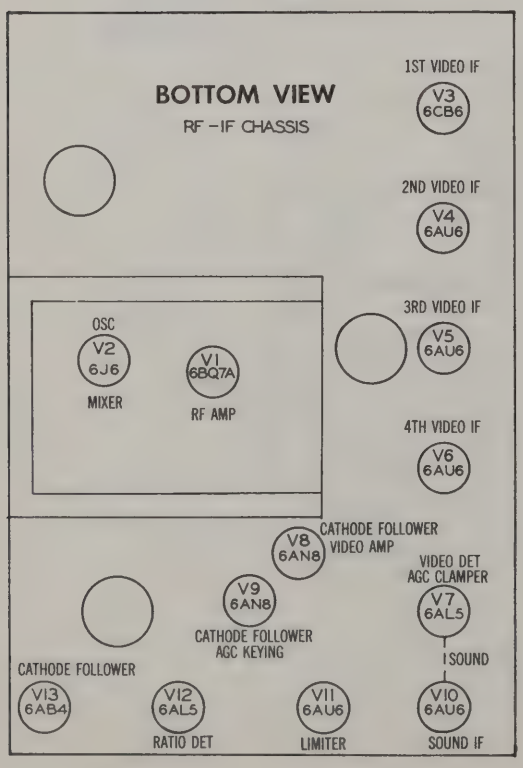


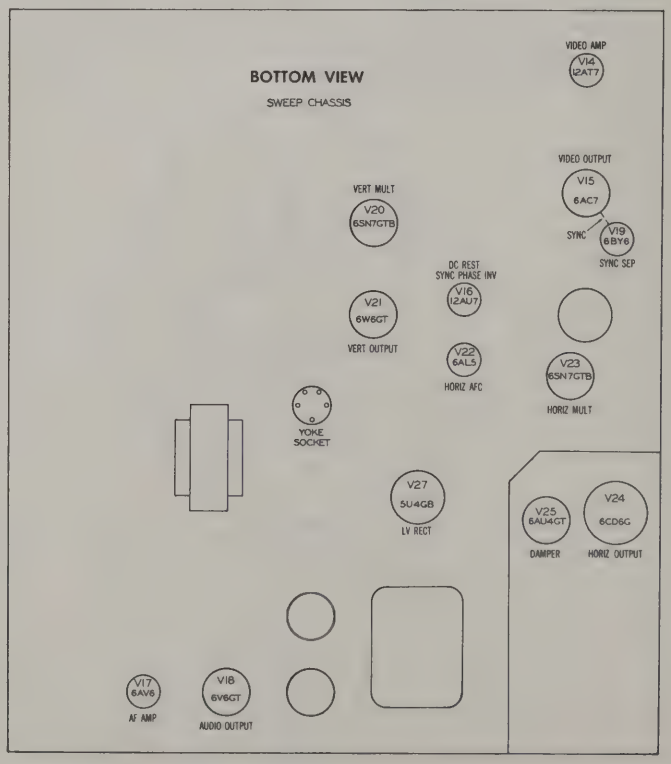
FIG. 4

RESISTANCE MEASUREMENTS

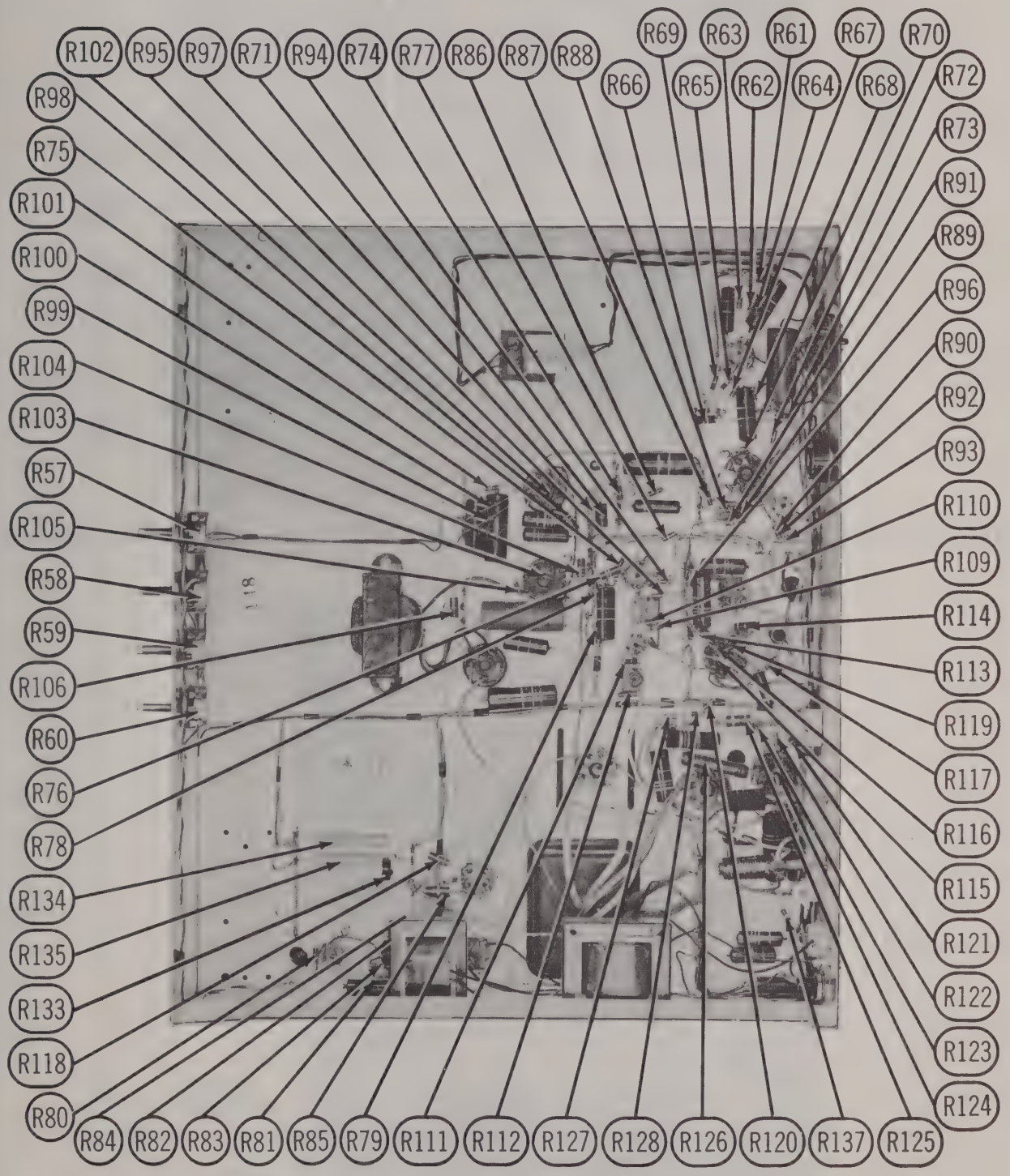
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	850KΩ	0Ω	0Ω	. 1Ω	‡ 1KΩ	350KΩ	INF	0Ω
V 2	6J6	§ 10KΩ	§ 8. 2KΩ	0Ω	. 1Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	120KΩ	47Ω	. 1Ω	0Ω	§ 700Ω	§ 700Ω	0Ω		
V 4	6AU6	120KΩ	0Ω	. 1Ω	0Ω	§ 550Ω	§ 550Ω	68Ω		
V 5	6AU6	120KΩ	0Ω	. 1Ω	0Ω	§ 400Ω	§ 400Ω	68Ω		
V 6	6AU6	. 9Ω	0Ω	. 1Ω	0Ω	§ 250Ω	§ 250Ω	150Ω		
V 7	6AL5	1Ω	850KΩ	. 1Ω	0Ω	0Ω	0Ω	4. 7KΩ		
V 8	6AN8	§ 85Ω	4. 7KΩ	75Ω	0Ω	. 1Ω	§ 3. 3KΩ	§ 8. 5KΩ	30KΩ	0Ω
V 9	6AN8	§ 85Ω	4. 7KΩ	75Ω	0Ω	. 1Ω	750KΩ	‡ 1KΩ	§ 14KΩ	§ 85Ω
V 10	6AU6	1. 9Ω	0Ω	0Ω	. 1Ω	§ 1. 1KΩ	§ 1. 1KΩ	150Ω		
V 11	6AU6	10KΩ	0Ω	. 1Ω	0Ω	§ 11KΩ	§ 11KΩ	0Ω		
V 12	6AL5	INF	INF	0Ω	. 1Ω	0Ω	0Ω	20KΩ		
V 13	6AB4	‡ 11KΩ	NC	. 1Ω	0Ω	NC	200KΩ	10KΩ		
V 14	12AT7	† 16KΩ	1Meg	330Ω	. 1Ω	. 1Ω	† 16KΩ	1Meg	220Ω	0Ω
V 15	6AC7	0Ω	0Ω	0Ω	470KΩ	120Ω	† 5. 8KΩ	. 1Ω	† 5. 5KΩ	
V 16	12AU7	† 5. 5KΩ	† 45KΩ	5. 4KΩ	0Ω	0Ω	† 470KΩ	† 470KΩ	† 11KΩ	. 1Ω
V 17	6AV6	10Meg	0Ω	. 1Ω	0Ω	0Ω	0Ω	† 170KΩ		
V 18	6V6GT	TP	0Ω	† 2. 4KΩ	† 1. 8KΩ	470KΩ	NC	. 1Ω	270Ω	
V 19	6BY6	1Meg	0Ω	. 1Ω	0Ω	† 45KΩ	† 15KΩ	2. 7Meg		
V 20	6SN7GTB	60KΩ	† 240KΩ	1. 5KΩ	300KΩ	▲ 2. 3Meg	1. 5KΩ	. 1Ω	0Ω	
V 21	6W6GT	NC	. 1Ω	† 900Ω	† 1. 4KΩ	1. 8Meg	NC	0Ω	1. 4KΩ	
V 22	6AL5	INF	INF	. 1Ω	0Ω	8Ω	0Ω	8Ω		
V 23	6SN7GTB	INF	† 11KΩ	1. 5KΩ	120KΩ	† 200KΩ	1. 5KΩ	. 1Ω	0Ω	
V 24	6CD6G	NC	0Ω	300Ω	NC	470KΩ	NC	. 1Ω	† 14KΩ	TOP CAP ▲ 80Ω
V 25	6AU4GT	NC	NC	350KΩ	NC	† 80Ω	NC	INF	INF	
V 26	1B3GT		PINS	1-8	HAVE	INF .	RESISTANCE			TOP CAP ▲ 455Ω
V 27	5U4GB	NC	15KΩ	NC	27Ω	NC	26Ω	NC	15KΩ	
V 28	27EP4A	0Ω	† 150KΩ	PIN 10 ▲ 100KΩ	PIN 11 † 500KΩ	PIN 12 . 1Ω				

‡ MEASURED FROM OUTPUT OF M1.
§ MEASURED FROM OUTPUT OF C2.
† MEASURED FROM PIN 8 OF V27.
▲ MEASURED FROM PIN 3 OF V25.
TP-TIE POINT.
NC-NO CONNECTION.





TUBE PLACEMENT CHART



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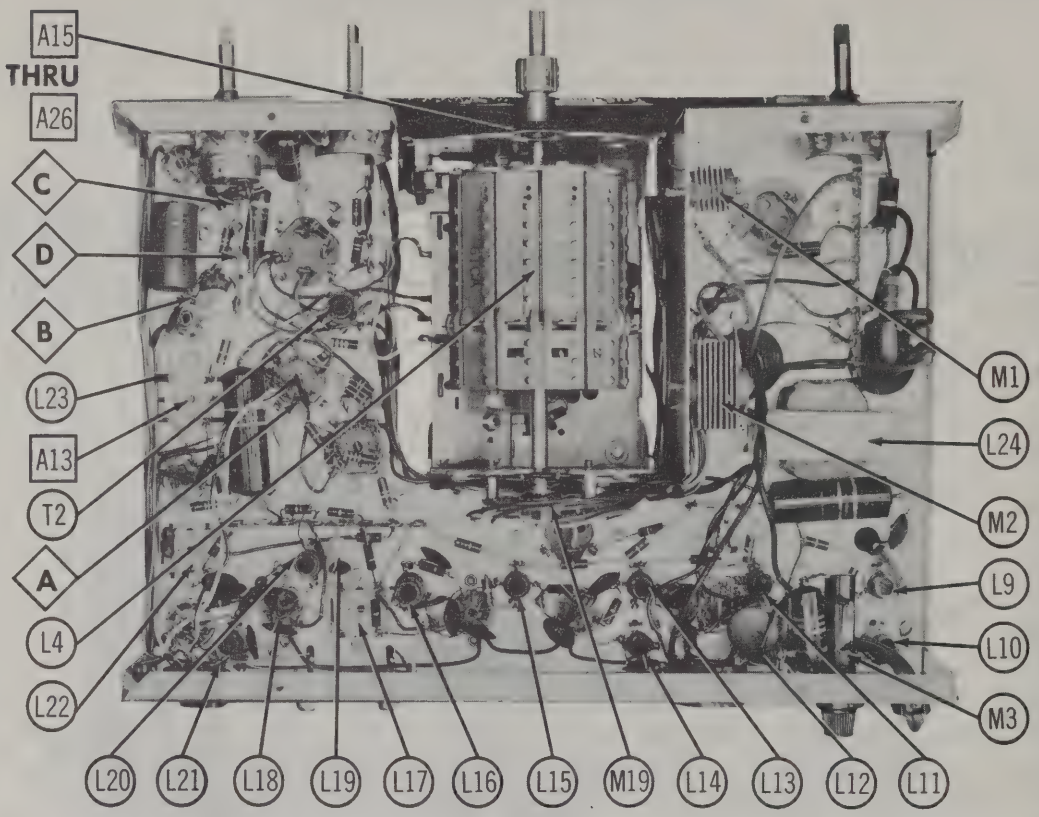
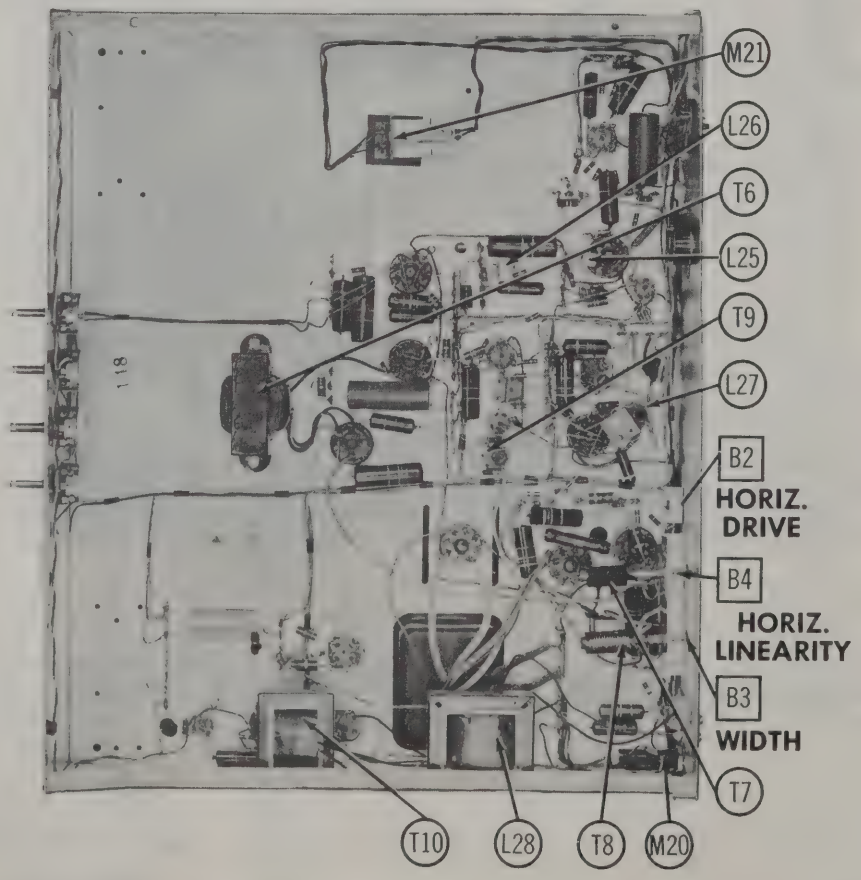
SWEEP CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RF-IF CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGNMENT IDENT.



SWEEP CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGNMENT IDENT.

PARTS LIST AND DESCRIPTIONS

RF-IF CHASSIS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		FLEETWOOD PART No.	STANDARD REPLACEMENT	
V1	RF Amplifier	6BQ7A	6BQ7A	
V2	Mixer-Oscillator	6J6	6J6	
V3	1st. Video IF Amplifier	6CB6	6CB6	
V4	2nd. Video IF Amplifier	6AU6	6AU6	
V5	3rd. Video IF Amplifier	6AU6	6AU6	
V6	4th. Video IF Amplifier	6AU6	6AU6	
V7	Video Detector-AGC Rectifier	6AL5	6AL5	
V8	Cathode Follower-Video Amplifier	6AN8	6AN8	
V9	Cathode Follower-AGC Keying	6AN8	6AN8	
V10	Sound IF Amplifier	6AU6	6AU6	
V11	Limiter	6AU6	6AU6	
V12	Ratio Detector	6AL5	6AL5	
V13	Cathode Follower	6AB4	6AB4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FLEETWOOD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	100	150		AFH1-21	XA003	FP116	TM-100-150	S-090	TVL-1423
C2	100	150		AFH1-21	XA003	FP116	TM-100-150	S-090	TVL-1423
C3A	■20	450		AFH4-14	D013	FP444	TM-Q20-450	Q-040	TVL-4763
B	▲20	450							
C	20	450							
D	▲20	450							
C4	5	50		PRS150V4	BR550	TC30	TD-4-50	MMT-0505	TVA-1303

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FLEETWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	1.5			NP0-SI1.5	TCZ-1R5	Z004	NP0A-1R5	ZT-5515	5TCCB-V15	
C6	6.8			NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C7	6.8			NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C8	2-10				829-10					
C9	800									
C10	2.2			NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C11	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C12	.5-3				829-3		3115-01-0R5	CT565A		
C13	800									
C14	.5-3				829-3		3115-01-0R5	CT565A		
C15	800									
C16	10									
C17	10									
C18	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C19	2.2			NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C20	10			N750-DI10	TCN-10	N018	N750A-100	NT-541	5TCU-Q1	
C21	47			N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C22	470			BPD-00047	DD-471	K060	831-471	UC-5347	5GA-T47	
C23	800									
C24	800									
C25	.47	200		P288N-47		CUB2P47		PT4047	2TM-P47	
C26	1.5			NP0-SI1.5	TCZ-1R5	TZ04	NP0A-1R5	ZT-5515	5TCCB-V15	
C27	22			NP0-DI22	TCZ-22	Z024	NP0K-220	ZT-5422	5TCC-Q22	
C28	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C29	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C30	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C31	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C32	1.5			NP0-SI1.5	TCZ-1R5	TZ04	NP0A-1R5	ZT-5515	5TCCB-V15	
C33	82			1469-000082	TCZ-82	5R5Q82	NP0-337-820		MS-482	
C34	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C35	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C36	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C37	.47	200		P288N-47		CUB2P47		PT4047	2TM-P47	
C38	1.5			NP0-SI1.5	TCZ-1R5	TZ04	NP0A-1R5	ZT-5515	5TCCB-V15	
C39	68			NP0-DI68	TCZ-68	Z038	NP0-337-680		5TCC-Q68	
C40	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C41	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C42	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C43	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C44	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C45	100			NP0-DI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C46	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C47	5			SI5	D6-050	TP06	GP1K-050	ZT-555	5GA-V5	Note 1
C48	82			1469-000082	D6-820	5R5Q82	801-820		MS-482	
C49	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C50	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C51	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C52	47			NP0-DI47	TCZ-47	Z033	NP0-338-470	ZT-5447	5TCC-Q47	
C53	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C54	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C55	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C56	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C57	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C58	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C59	680			SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C60	.0047	600		SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C61	.022	600		BPD-02	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C62	5000	1000		HVD-15-5000	DD-502	VD47	1R5KV-472		10HK-D47	
C63	5000	1000		HVD-15-5000	DD-502	VD47	1R5KV-472		10HK-D47	
C64	.022	600		BPD-02	DF-203	CUB6S22	817-02	PT6122	6TM-S22	

Note 1. Some versions use 5.6MMF in this application.

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PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FLEETWOOD PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	1022	AB-50	A47-500K-Z	Q13-153	U-46	Volume
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	KB-1	SWE-13	76-1	U3-36	Attach to R1A.
R2A	100KΩ	½	1019	B-40	A47-100K-S	Q11-128	U-41	Brightness
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	25KΩ	½	1026	B-26	A47-25K-S	Q11-120	U-39	Contrast
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A.

RESISTORS

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA FLEETWOOD PART No	IRC PART No.	NOTES
R4	560KΩ	½		BTS-470U	
R5	470KΩ	½		BTS-470U	
R6	820KΩ	½		BTS-820K	
R7	560KΩ	½		BTS-560K	
R8	10KΩ	½			
R9	10KΩ	½			
R10	220KΩ	½			
R11	82000Ω	½			
R12	120KΩ	½		BTS-120K	
R13	1Meg	½		BTS-1Meg	
R14	470K	½		BTS-470K	
R15	100KΩ	½		BTS-100K	
R16	2.2Meg	½		BTS-2.2Meg	
R17	22000Ω	½			
R18	1000Ω	½		BTS-1000	
R19	150Ω	½		BTS-150	
R20	47Ω	½		BTS-47	
R21	82000Ω	½			
R22	1000Ω	½		BTS-1000	
R23	150Ω	½		BTS-150	
R24	68Ω	½		BTS-68	
R25	82000Ω	½			
R26	1000Ω	½		BTS-1000	
R27	150Ω	½		BTS-150	
R28	68Ω	½		BTS-68	
R29	68000Ω	½			
R30	5600Ω	½			

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA FLEETWOOD PART No	IRC PART No.	NOTES
R31	150Ω	½		BTS-150	
R32	150Ω	½		BTS-150	
R33	4700Ω	½		BTS-4700	
R34	150Ω	½		BTS-150	
R35	1000Ω	½		BTS-1000	
R36	47KΩ	½		BTS-47K	Note 1
R37	100KΩ	½		BTS-100K	Note 1
R38	3300Ω	½		BTS-3300	
R39	15KΩ	½		BTS-15K	
R40	10KΩ	½		BTS-10K	Note 2
R41	33KΩ	½		BTS-33K	
R42	1000Ω	½		BTS-1000	
R43	150Ω	½		BTS-150	
R44	10KΩ	½		BTS-10K	
R45	15KΩ	1		BTA-15K	
R46	22KΩ	½		BTS-22K	
R47	47Ω	½		BTS-47	
R48	10KΩ	½		BTS-10K	
R49	10KΩ	½		BTS-10K	
R50	15KΩ	½		BTS-15K	
R51	10KΩ	½		BTS-10K	
R52	10KΩ	½		BTS-10K	
R53	1.2Ω	1		BW1-L 2	
R54	22Ω	2			
R55	1000Ω	½		BTA-1000	
R56	82Ω	½		BTS-82	

Note 1. Not used in some versions.
Note 2. Some versions use a 47KΩ ½W resistor in this application.

TRANSFORMER (POWER)

ITEM No	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA FLEETWOOD PART No	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
T1	117VAC .85A	630VAC @ .098A & 275VAC @ .017A	6.3VAC @ 5.1A		1043B					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA FLEETWOOD PART No	Halldorson PART No.	Merit PART No.	RCA TYPE No	Rom PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
T2	AGC Keyer Trans. Pri. (.04-.13MH) Sec. (8-33MH)	1085							

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FLEETWOOD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Matching Trans.	0Ω	0Ω					
L2	Ant. Matching Trans.	0Ω	0Ω					
L3	IF Trap	0Ω						
L4	Ant., RF, Mixer Grid & Osc. Coils	0Ω						
L5	FIL. Choke	0Ω						
L6	Neut. Coil	0Ω						
L7	RF Coil	0Ω						
L8	Conv. Plate	.5Ω		1200	17-1063	TV-112	6349 •	
L9	1st. Video IF	.2Ω		1200	20-1021			
L10	18.75MC Trap	.2Ω		1203	20-1021			
L11	2nd. Video IF	.9Ω	.3Ω	1264	17-1063	TV-116	6349	
L12	27.25MC Trap	0Ω		1201	20-1004			
L13	3rd. Video IF	.9Ω	.3Ω	1264	17-1064	TV-116	6349	
L14	21.25MC Trap	0Ω		1202	20-1021	TV-150	6349	
L15	4th. Video IF	.9Ω	.9Ω	1264	17-1064	TV-116	6349	
L16	Cathode Trap	0Ω	0Ω	1161	20-1021	TV-150	6347	
L17	5th. Video IF	1Ω	1Ω	1160	17-1063			
L18	Series Peaking Coil	10.5Ω		1204	19-1360 ■		6130 ■	150 Microhenries, wound on 10KΩ resistor
L19	Shunt Peaking Coil	14.5Ω		1039	19-3300		6133	315 Microhenries
L20	4.5MC Trap	1.4Ω		1042	20-1004	TV-151	1469	
L21	1st. Sound IF	1.9Ω		1079	20-1004	TV-151	1469	
L22	2nd. Sound IF	2.2Ω		1078	18-3445 ▲	TV-113 ▲	6303 ▲	
L23	Ratio Detector	3.9Ω	.6Ω	956	17-1033	TV-110	1498	Tertiary winding -.3Ω

* Use one winding only.
■ Parallel with 10KΩ resistor.
▲ Use one winding only and use adaptor plate.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE IO CURRENT 1000 ^d.c.	REPLACEMENT DATA FLEETWOOD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L24	098ADC	85Ω	2.1HY	1044B	C6040	C2994	C2327	26C41	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA FLEETWOOD PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.017ADC		1363A	R8050	6865	821	50	
M3	.098ADC		1014A	RR8100	8200	6M3	109	

FUSES

ITEM No	TYPE	RATING	REPLACEMENT DATA FLEETWOOD PART No. FUSE	FLEETWOOD PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	3AG	3A 250V			312003, .3AG 3A)	342001	AGC 3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	FLEETWOOD PART No.	NOTES
M4	Dial Light		#44
M5	Dial Light		#44
M6	Channel Light		#44 - Channel 2
M7	Channel Light		#44 - Channel 3
M8	Channel Light		#44 - Channel 4
M9	Channel Light		#44 - Channel 5
M10	Channel Light		#44 - Channel 6
M11	Channel Light		#44 - Channel 7
M12	Channel Light		#44 - Channel 8
M13	Channel Light		#44 - Channel 9
M14	Channel Light		#44 - Channel 10
M15	Channel Light		#44 - Channel 11
M16	Channel Light		#44 - Channel 12
M17	Channel Light		#44 - Channel 13
M18	Tuner	1153	
M19	Switch		Channel light selector (Rotary-wafer type) part of tuner
	Trimmer	53Mll	Definition (1.5-5.1MMF) Variable (Air)

SWEEP CHASSIS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	REPLACEMENT DATA FLEETWOOD PART No.	STANDARD REPLACEMENT	NOTES
V14	Video Amplifier	12AT7	12AT7	
V15	Video Output	6AC7	6AC7	
V16	DC Restorer-Sync Phase Inverter	12AU7	12AU7	6SN7GT may be used in some versions
V17	AF Amplifier	6AV6	6AV6	
V18	Audio Output	6V6GT	6V6GT	
V19	Sync Separator	6BY6	6BY6	
V20	Vertical Mult.	6SN7GTB	6SN7GTB	
V21	Vertical Output	6W6GT	6W6GT	
V22	Horiz. AFC	6AL5	6AL5	
V23	Horiz. Mult.	6SN7GTB	6SN7GTB	
V24	Horiz. Output	6CD6G	6CD6G	
V25	Damper	6AU6GT	6AU6GT	
V26	HV Rectifier	1B3GT	1B3GT	
V27	LV Rectifier	5U4GB	5U4GB	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA FLEETWOOD PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V28	27EP4 ① 27RP4 ① 24CP4A ① 24TP4 ① 21AMP4	27EP4 ① 27RP4 ① 24CP4A ① 21AMP4 21AMP4A ①	27EP4 ① 27RP4 ① 24CP4A ① 21AC24A / 21AMP4A ①	27EP4 ② ① Aluminized 27RP4 ② ② Silver screen "85" 24CP4A ② 21AMP4A ②	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FLEETWOOD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C85A	▲40	475		AFH3-72	BC63	FP262	TM-D40-500	D-365	TVL-2880
B	▲40	475							
C86A	▲20	450		AFH4-14	D013	FP444	TM-Q20-450	Q-940	TVL-4783
B	20	450							
C	▲20	450							
D	▲20	450							
C87A	▲20	450		AFH4-87	D052	FP378.5 TC38	TM-4018	Q-340	TVL-3780 TVA-1305
B	▲20	450							
C	20	25							
D	▲20	450							
C88	10	450		PSR450V10	BR1045	TC72	TD-10-450	FM-4510	TVA-1705
C89	100	50		PSR50V10	BR8501	TC3501	TD-100-50	MTS-5010	TVA-1310

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FLEETWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C70	.1	600		P488N-1	DF-104	CUB4P1		PT401	47M-P1	
C71	.05	600		BPD-01	DS-503	CUB5P1	GP3-333-103	PT501	57M-S1	
C72	.1	400		P488N-1	DF-104	CUB4P1		PT401	47M-P1	
C73	1500	500		SI3500	D6-152	IWD515	GP3L-153	MC356	1FM-215	
C74	.22	400		P488N-22		CUB4P23		PT4022	47M-P22	
C75	.1	400		P488N-1	DF-104	CUB4P1		PT401	47M-P1	
C76	.022	500		BPD-03	DF-303	CUB5P23	817-03	PT1023	57M-S22	
C77	5000			BPD-006	DD-502	K080	811-005	DC-525	5HK-D5	
C78	.022	600		BPD-02	817-03	CUB6P23	817-03	PT1123	67M-S22	
C79	.0047	600		S14700	D6-472	CUB6D47	GP3-333-472	PT5247	67M-D47	
C80	.0068	600		SI6800	D6-682	CUB6D68	GP3-333-682		67M-D68	
C81	220	500		SI220	D6-221	SWP722	GP2E-221	MC340	1FM-322	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FLEETWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C82A	10000					K042	811-01	DC-512		
B	3000			6PA-111	▲PC-101	K072	801-002	DC-522	▲V-2	
C	5000					K090	811-003	DC-523		
D	5000					K080	811-005	DC-525		
C83	.018	600								
C84	.0068	600		SI6800	D6-682	CUB6D68	811-0868		67M-D68	
C85	.047	600		BPD-05	DF-503	CUB6P47		PT6147	67M-S47	
C86	.1	600		P488N-1	DF-104	CUB6P1		PT601	67M-P1	
C87	500	500		1469-0005	D6-501	5HS75	811-501	MC3545	5HS-35	
C88	500	500		1469-0008	D6-501	5HS75	811-501	MC3545	5HS-35	
C89	5000			BPD-005	DD-503	K090	811-006	DC-526	5HK-D6	
C90	.047	600		BPD-05	DF-503	CUB6P47		PT6147	67M-S47	
C91	1000	500		1464-0029		1R5219		MC2643	5M-319	
C92	500	500		1469-00039		5HS739		MC3543	5HS-339	
C93	.0047	600		SI4700	D6-472	CUB6D47	GP3-333-472	PT6247	67M-D47	
C94	370	500		TCS-370	D6-371	5HS737	MPG-338-371	MC3541	5HS-337	
C95	.1	600		P488N-1	DF-104	CUB6P1		PT601	67M-P1	
C96	.47	200		P268N-47		CUB2P47		PT2047	37M-P47	
C97	.047	600		BPD-05	DF-503	CUB6P47		PT6147	67M-S47	
C98	.047	600		BPD-05	DF-503	CUB6P47		PT6147	67M-S47	
C99	500	30000		UV-503	TV3-503	MMU-30T5	413		HV30035A	30DK-T5
C100	.033	600		BPD-03	DF-303	CUB6S33	817-03		PT6133	67M-S33
C101	100	3000		HVD-30-100	DD30-101	V3T1	3KV-101		DC3031	30GA-T1	Note 2
C102	.33	200		P283N-33		CUB2P33			PT4033	37M-P33	
C103	100	2500		HVD-30-100	DD30-101	V3T1	3KV-101		DC3031	30GA-T1	Note 3
C104	.022	600		BPD-02	DF-203	CUB6S23	817-02		PT6123	67M-S23	
C105	.022	600		BPD-02	DF-203	CUB6S23	817-02		PT6123	67M-S23	

Note 2. Not used in some versions.
Note 3. Some versions use 115MMF in this application.
• Items C88A, C88B, C88C, C88D, R97A, R97B, R97C, R97D are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FLEETWOOD PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R57A	100KΩ	½	1106	AB-40	A47-100K-S	Q11-128	U-41	Horizontal Hold
B	Shaft		Not Req.	AK-4	RS-3	Not Req.	Not Req.	Attach to R57A.
R58A	2Meg	½	1104	AB-75	A47-2Meg-S	Q11-139	U-36	Height
B	Shaft		Not Req.	AK-4	RS-3	Not Req.	Not Req.	Attach to R58A.
R59A	3000Ω	2	1105	V-133	A43-3000	WPK3000	R3000L	Vertical Linearity (Wire Wound)
B	Shaft		Not Req.	Not Req.	RS-3	Not Req.	D6-36	Attach to R59A.
R60A	250KΩ	½	1107	AB-50	A47-250K-S	Q11-130	U-46	Vertical Hold
B	Shaft		Not Req.	AK-4	RS-3	Not Req.	Not Req.	Attach to R60A.

RESISTORS

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA FLEETWOOD PART No	IRC PART No	NOTES
R61	750 5%	1		BTA-75 5%	
R62	1Meg	½		BTS-1Meg	
R63	4700Ω	½		BTS-470U	
R64	330Ω	½		BTS-330U	
R65	1Meg	½		BTS-1Meg	
R66	10KΩ	1		BTA-10K	
R67	4700Ω	½		BTS-470U	
R68	27000 5%	½		BTS-2700 5%	
R69	220Ω	1		BTS-220	
R70	470KΩ	½		BTS-470K	
R71	47000 5%	2		BTB-4700 5%	
R72	120Ω	1		BTS-120	
R73	220Ω	1		BTS-220	
R74	22KΩ	1		BTS-22K	
R75	470KΩ	½		BTS-470K	
R78	15KΩ	1		BTA-15K	Note 3
R77	6800Ω	½		BTS-6800	Note 4
R78	180KΩ	½		BTS-180K	Note 5
R79	100KΩ	½		BTS-100K	
R80	10Meg	½		BTS-10Meg	
R81	220KΩ	½		BTS-220K	
R82	470KΩ	½		BTS-470K	
R83	1.2Meg	½		BTS-1.2Meg	
R84	270Ω	1		BTS-270	
R85	100Ω	2		BTB-100U	
R86	22KΩ	1		BTS-22K	
R87	2.2Meg	½		BTS-2.2Meg	
R88	470KΩ	½		BTS-470K	
R89	1Meg	½		BTS-1Meg	
R90	390KΩ	½		BTS-390K	
R91	18KΩ	1		BTA-18K	
R92	6800Ω	½		BTS-6800	
R93	33KΩ	½		BTS-33K	
R94	4700Ω	½		BTS-470U	
R95	39000 5%	½		BTS-3900 5%	
R96	15000 5%	½		BTS-1500 5%	
R97A	22KΩ	½		BTS-22K	
B	22KΩ	½	•	BTS-22K	
C	8200Ω	½		BTS-8200	
D	8200Ω	½		BTS-8200	

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA FLEETWOOD PART No	IRC PART No	NOTES
R98	240KΩ 5%	½		BTA-240K 5%	
R99	330KΩ	½		BTS-330K	
R100	1.5Meg	½		BTS-1.5Meg	
R101	15KΩ	½		BTS-15K	
R102	15000 5%	½		BTS-1500 5%	
R103	1.5Meg	½		BTS-1.5Meg	
R104	470Ω	1		BTA-470	
R105	470Ω	1		BTA-470	
R106	470Ω	1		BTA-470	
R107	[illegible]				
R108	[illegible]				
R111	82000Ω	½			Note 6
R112	4.7Ω	½		BW1-4.7	
R113	470KΩ	½			
R114	58000 5%	½			
R115	180KΩ	½			
R116	270KΩ	½			
R117	270KΩ	½			
R118	56000 5%	½			
R119	15000 5%	½			
R120	680KΩ	½		BTS-680K	
R121	68000Ω	½			
R122	18KΩ	½			
R123	470KΩ	½			
R124	6800Ω	½			
R125	68000Ω	½			
R126	300Ω	10			1 9/4A-300
R127	100KΩ	½			
R128	330KΩ	½			
R129	470Ω	½			Note 7
R130	82Ω	½			BW1-.82
R131	100KΩ	½			
R132	100KΩ	1			
R133	100	1			BTA-10
R134	750Ω	10			PW10-750
R135	5000Ω	10			PW10-5000
R136	33KΩ	½			BTA-33K Note 7
R137	100KΩ	½			BTS-100K

Note 3. Some versions use a 8200Ω 2W resistor in this application.
Note 4. Some versions use a 3900Ω 1W resistor in this application.
Note 5. Some versions use a 330KΩ ½W resistor in this application.
Note 6. Some versions use a 1800KΩ ½W resistor in this application.
Note 7. Not used in some versions.
Note 8. Some versions use a 1Meg ½W resistor in this application.
• Items R97A, R97B, R97C, R97D, C82A, C82B, C82C, C82D are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA FLEETWOOD PART No	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
T3	117VAC 1.85A	640VCT .270A	5VAC @ 3A	① 6.3VAC @ 1.6A ② 6.3VAC ③ 1.6A	638	P971F ②	P2833 ①	P8335 ①	26R00 ③	

① Parallel @ phase 6.3V ⓒ 6.4A windings to obtain 6.3V ⓓ 12.8A. Tape 6.3V ⓒ .8A winding.
② Tape 5V ⓑ 2A winding.
③ Tape 640VCT and 720VCT HV windings. Tape 5V ⓐ 6A winding. Parallel @ phase 6.3V ⓒ 2A, 6.3V ⓓ 2A, 6.3V ⓔ 2A windings.
④ Drill new mounting holes.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		FLEETWOOD PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T4	Horiz. Output Trans.	1082	FB419 *	HVO-36 *	235T1 *	X094 *	A-8253①*	FLY-16 *	D-50 *
T5	Vert. Output Trans.		Z1900 ②	A-2823		V307	A-8142	26S72	A-108X
T6A	Yoke (90°)Horiz. (12MH		DF606 ③	MDF-91④	237D1 ③	Y90F12/	DY-13A ④	Y-14 ③	Y-40-1 ④
B	Vert. (40MH)					47 ③			
T7	Horiz. Lin. Coil (1.4-11MH)	1134	RF800 ⑤ ⑥	MWC-6 ⑤	213R1	201R15	WC-8	WC-22	WC-12 ⑦
T8	Width Coil (3.75-22.5MH)With AGC Sec. (.3-.12MH)	1037							
T9	Horiz. AFC Trans. Pri. (.14-.71MH) Sec. (.79-2.85MH)	849							

① Drill new mounting hole(s).
② Use 8 to 1 turns ratio.
③ Connect horiz. damping network to terminals #3 & #7. Use original network if necessary.
④ Use original horiz. damping network if necessary.
⑤ Enlarge mounting hole.
⑥ Use terminals #3 & #4.
⑦ Use red & blue terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	9	9	9	9	9	8	9	9
	7	7	7	7	7	1	7	7
	5	5	5	5	5	2	5	5
	3	3	3	3	3	3	3	3
	1	1	1	1	1	4	1	1
Connect Width Coil Across →	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1	6 & 7	3 & 1	3 & 1
Special Notes →						⑧		

⑧ Ground term #6.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FLEETWOOD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T10	7.7KΩ	3.4Ω	857	Z1003	A3020	A3849	24S61	S-9Z	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FLEETWOOD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L25	Series Peaking Coil	13Ω		1217	19-4201 ▲		6154 ▲	228 Microhenries, wound on 18KΩ resistor
L26	Shunt Peaking Coil	17.5Ω		1216	19-4400		6136	430 Microhenries

▲ Parallel with 18KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	FLEETWOOD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L27	105Ω		994	19-1576	TV-163	6210			HS-5	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	FLEETWOOD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L28	.270ADC	68Ω	3.2HY	1056	C5037	C2996	C2334 ①		C-17X

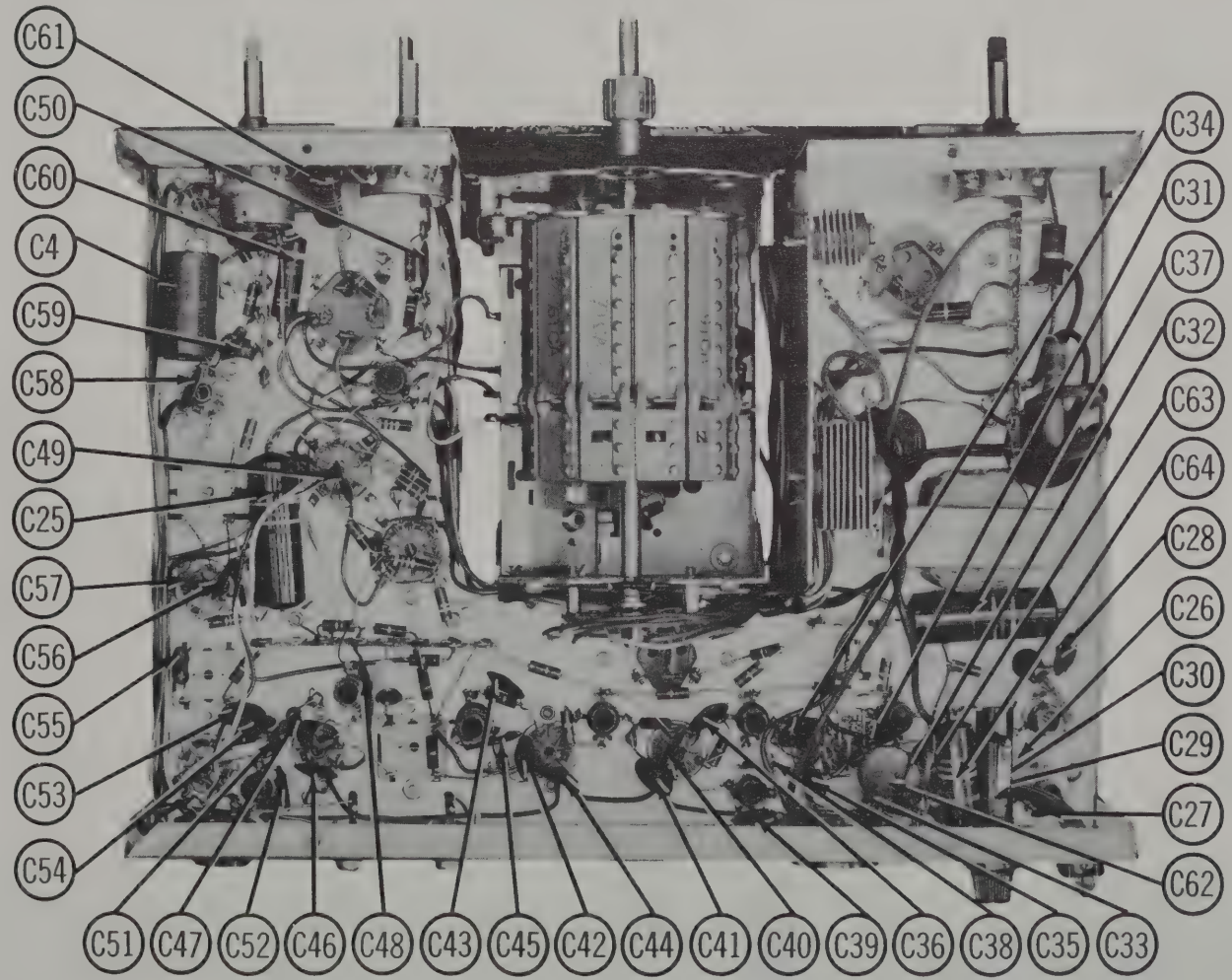
① Drill one new mounting hole.

FUSES

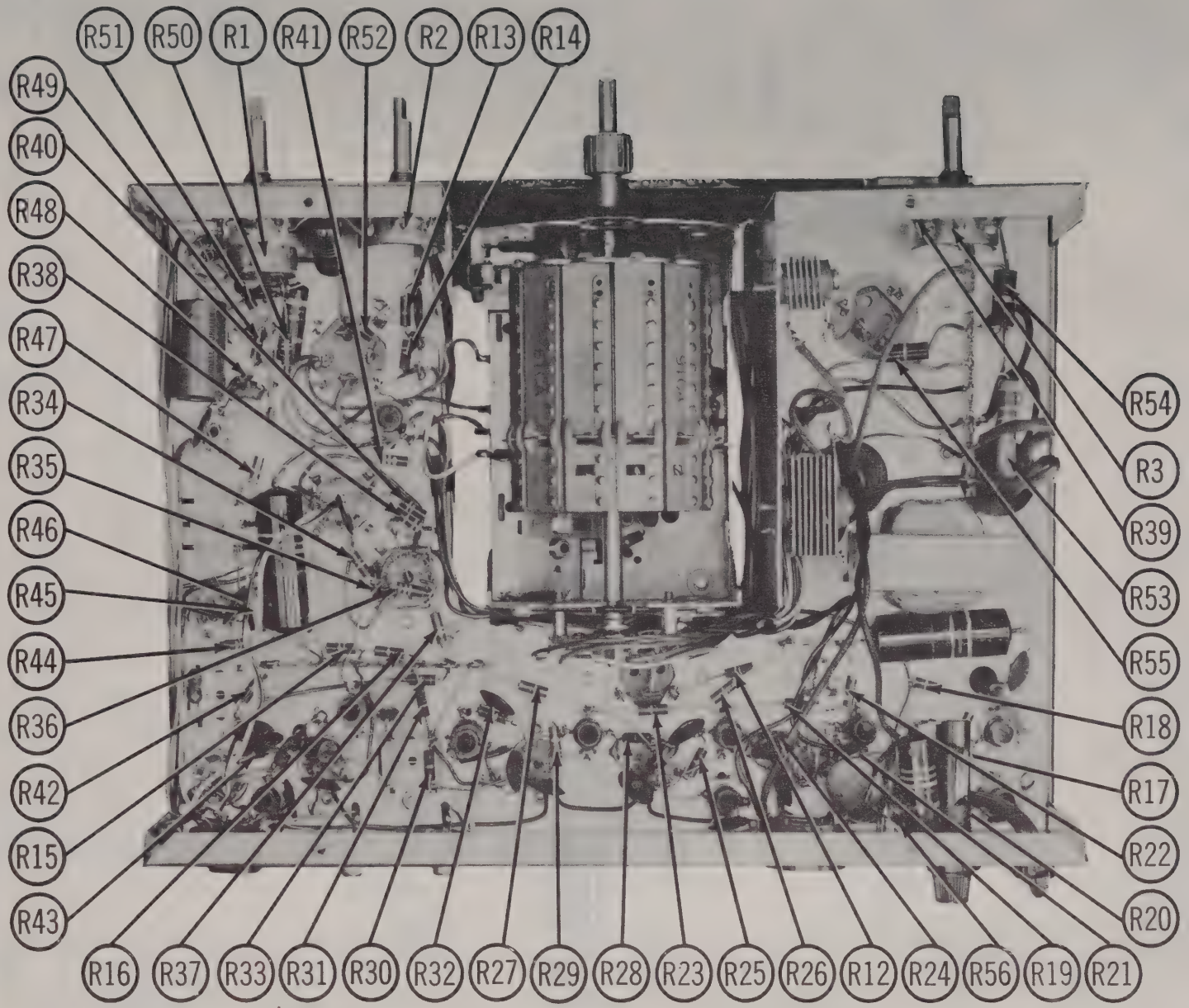
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FLEETWOOD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M20	3AG	3A 250V			312003. (3AG 3A)	342001	AGC 3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	FLEETWOOD PART No.	NOTES
M21	Relay	1021-UL	On-off (power) deflection chassis
M22	Focus Magnet	S2640	Includes centering device
B2	Trimmer Cap.	1186	Horiz. Drive (65-320MMF)



RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



RF-IF CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION

PHOTOSTAT
L. F. FRANKENSHIP
3004 MAPLE ST.
DENVER, COLORADO

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

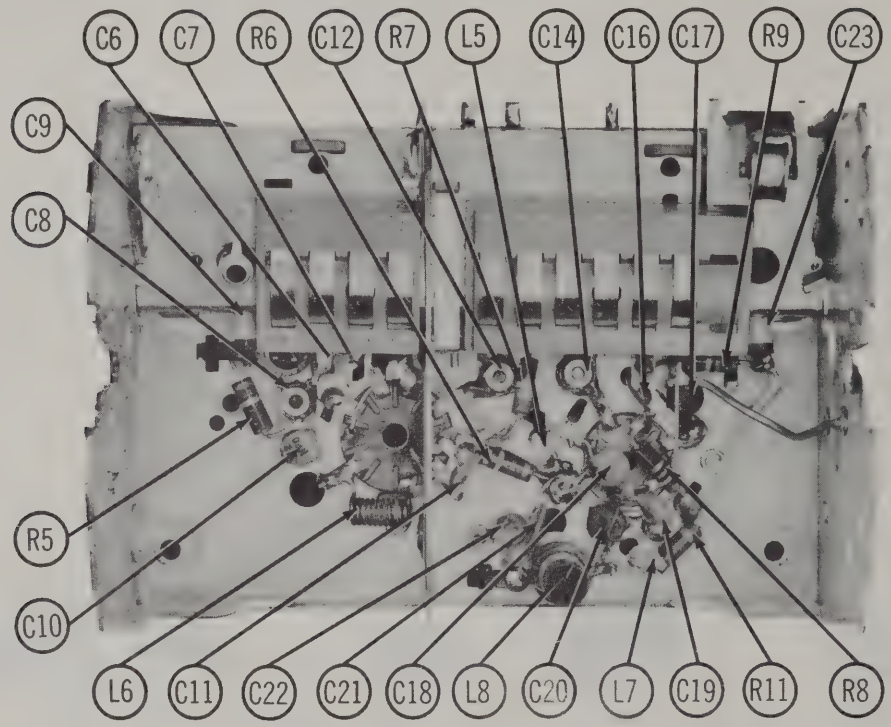
Turn the set on and tune in a TV station, preferably with a test pattern. Set the horizontal hold control to its mid-range position. Ground pin 1 (grid) of the horizontal multivibrator (V23) to chassis.

Adjust the horizontal oscillator slug (B1) until the picture is almost in sync. Remove short from pin 1 of V23 . Check pull-in action by switching off channel and back again. If necessary retouch B1 for proper pull-in action.

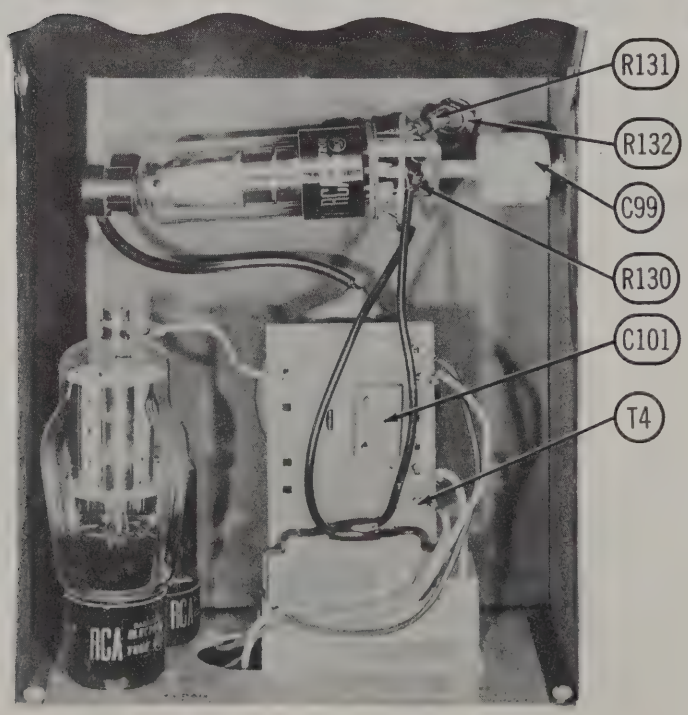
Turn the horizontal drive trimmer (B2) clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture or without having the picture fall out of sync horizontally.

Adjust the width slug (B3) for a picture that is slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.



RF TUNER BOTTOM VIEW

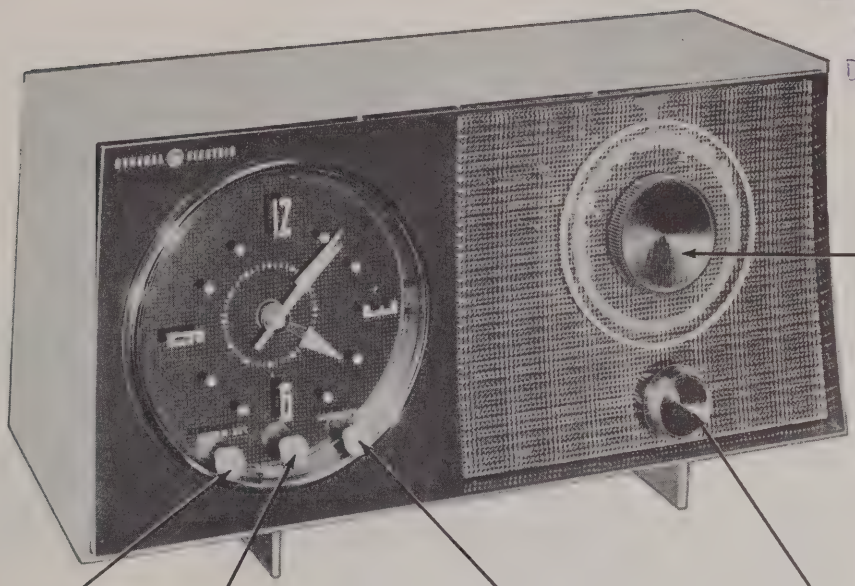


HIGH VOLTAGE COMPARTMENT

PROPERTY OF
L. F. BLANKENS
3924 MEADE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
2004 MEADE ST.
DENVER, COLORADO

GENERAL ELECTRIC MODELS
905, 906, 907, 915, 916



GENERAL ELECTRIC MODELS
905, 906, 907, 915, 916

TRADE NAME	General Electric Models 905, 906, 907, 915, 916
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N. Y.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12AU6 Converter, 12BA6, IF Amp., 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles
RATING	.23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 12AU6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several tunrs of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

GENERAL ELECTRIC MODEL 905

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		General Electric PART No.	STANDARD REPLACEMENT	
V1	Converter	12AU6	12AU6	
V2	IF Amp.	12BA6	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	12AV6	
V4	Output	50C5	50C5	
V5	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	General Electric PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	75	150	RCE-215			TCT3115		CADP-513	
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	22		RCW-3196	NPO-S122	TCZ-22	TZ14	NPOK-220		5TCC-Q22	
C3	22		RCW-3196	NPO-S122	TCZ-22	TZ14	NPOK-220		5TCC-Q22	
C4	3		RCW-3216							
C5	.05	200	RCC-086	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C6A	400		♦ RCW-3207							
B	2000									
C	220									
D	5000									
C7	10000		RCW-3186	BPD-01	DD-103	KO82	811-01	DC-511	5HK-S1	
C8	.047	600	RCN-053	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	

♦ Items C6A, C6B, C6C, C6D, R4A, R4B and R4C are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RRC-325	AB-60	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft		Not Req.	AK-4	KSS-8	Not Req.	Not Req.	Attach to R1A.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R2	2.2Meg	½	URD-129	BTS-2.2Meg	
R3	2.2Meg	½	URD-129	BTS-2.2Meg	
R4A	6.8Meg		♦ RCW-3207	BTS-6.8Meg	
B	470KΩ			BTS-470K	
C	470KΩ			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R5	1500Ω	2	URF-053	BTB-1500	
R6	180Ω	½	URD-031	BTS-180	

♦ Items R4A, R4B, R4C, C6A, C6B, C6C, C6D are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	General Electric PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.7KΩ	3.4Ω	RTO-176				26S58 ①		① Use original channel.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	General Electric PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3.4Ω	ROP-033	4A07	223S1	

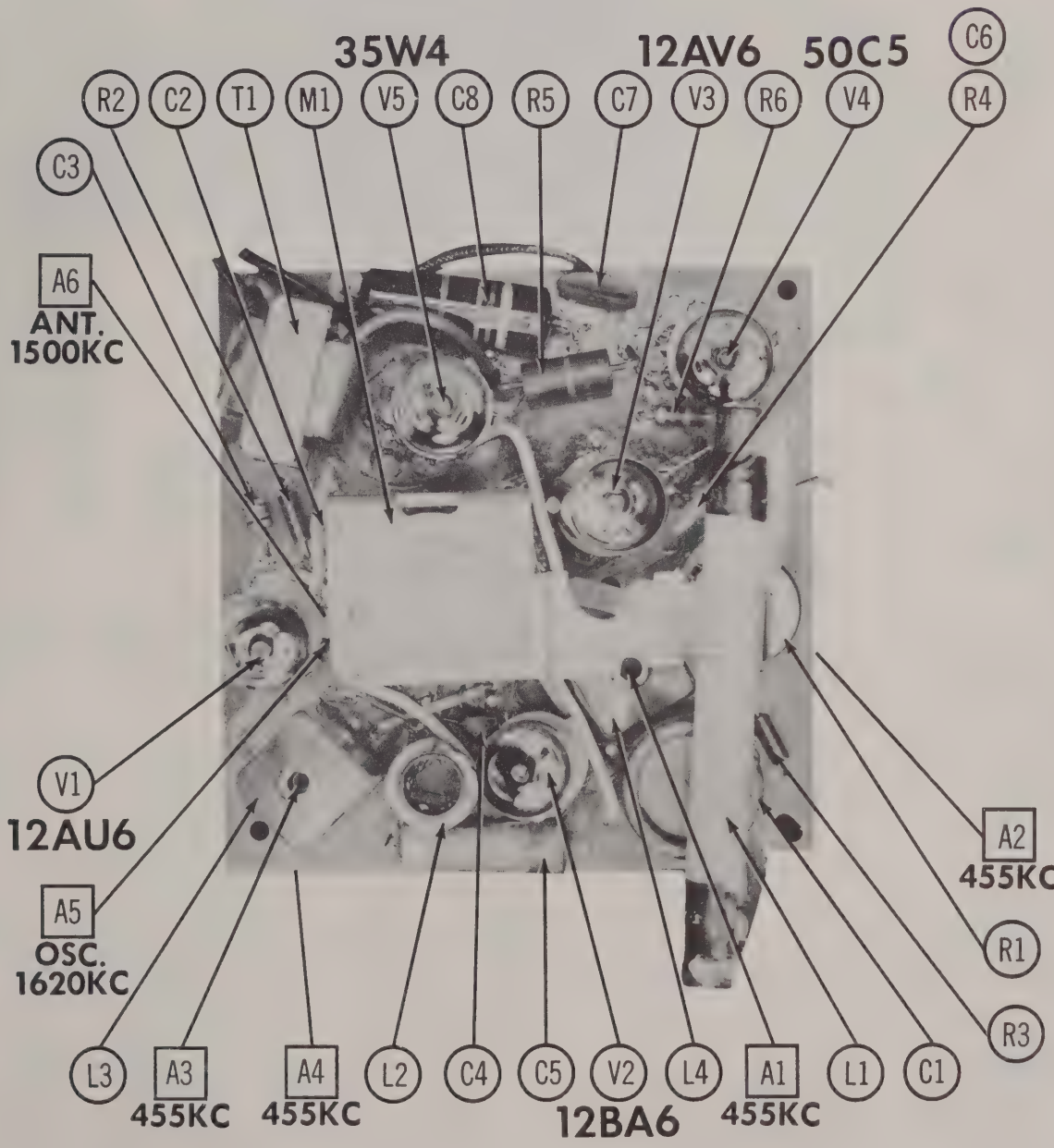
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.3Ω		RLL-064				
L2	Osc. Coil	1.5Ω	8Ω	RLC-135				Tertiary Winding=1.9Ω
L3	Input IF	25Ω	25Ω	RTL-183	16-6758	BC-352	13-PC1	
L4	Output IF	25Ω	25Ω	RTL-183	16-6758	BC-353	13-PC2	

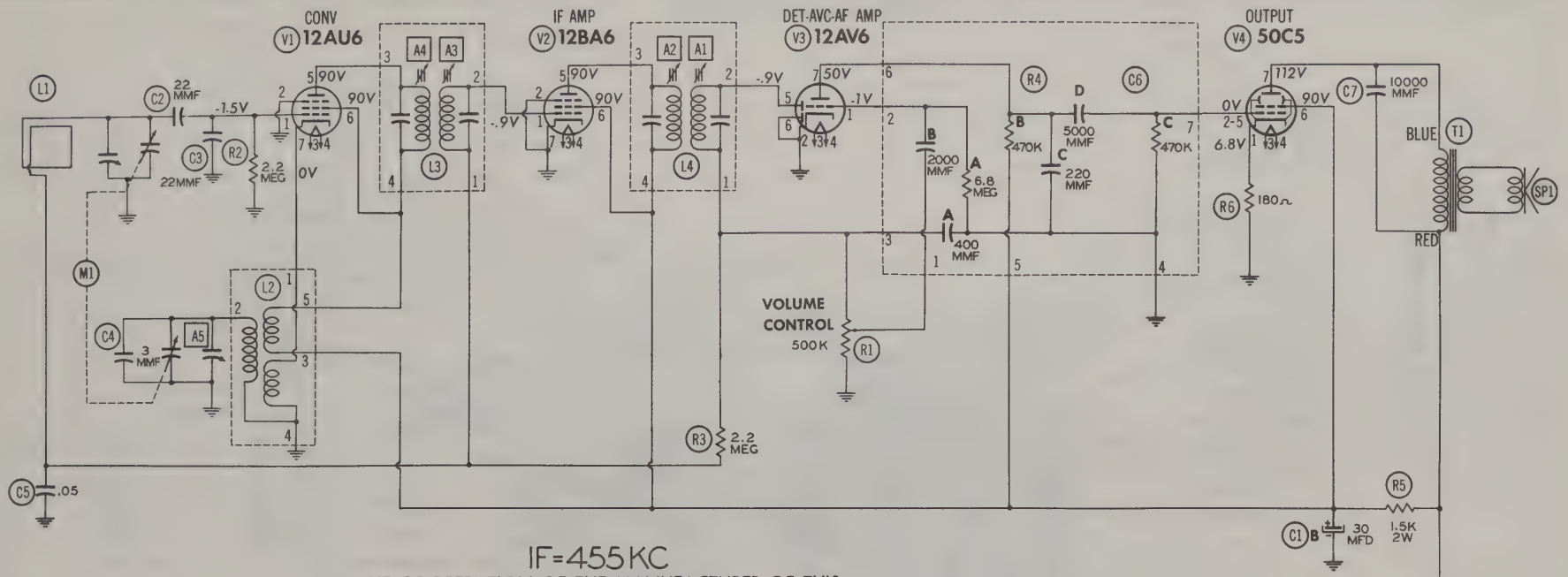
MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M1	Tuning Cap.	RCT-093	2 Gang (15-290MMF, 19-125MMF)
M2	Clock Assy.	RZC-049	Model 915
	Clock Assy.	RZC-051	Models 905, 907
	Clock Assy.	RZC-052	Model 906
	Clock Assy.	RZC-060	Model 916
	Cabinet	RAB-272	Back-Models 905, 915
	Cabinet	RAB-273	Back-Models 906, 916
	Cabinet	RAB-274	Back-Model 907
	Cabinet	RAC-163	Front-Model 915
	Cabinet	RAC-164	Front-Model 916
	Cabinet	RAC-165	Front-Model 905
	Cabinet	RAC-166	Front-Model 906
	Cabinet	RAC-167	Front-Model 907
	Knob	RDK-425	Volume
	Knob	RDK-508	Tuning-Models 905, 915
	Knob	RDK-509	Tuning-Models 906, 916
	Knob	RDK-510	Tuning-Model 907
	Knob	RZK-032	Clock-Models 905, 907, 915
	Knob	RZK-033	Clock-Models 906, 916
	Pointer	RDP-087	
	Crystal	RZW-018	Models 915, 916, White
	Crystal	RZW-019	Model 916, Gold
	Crystal	RZW-020	Models 905, 906, 907, White
	Crystal	RZW-021	Model 906, Gold

PROPERTY OF
F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

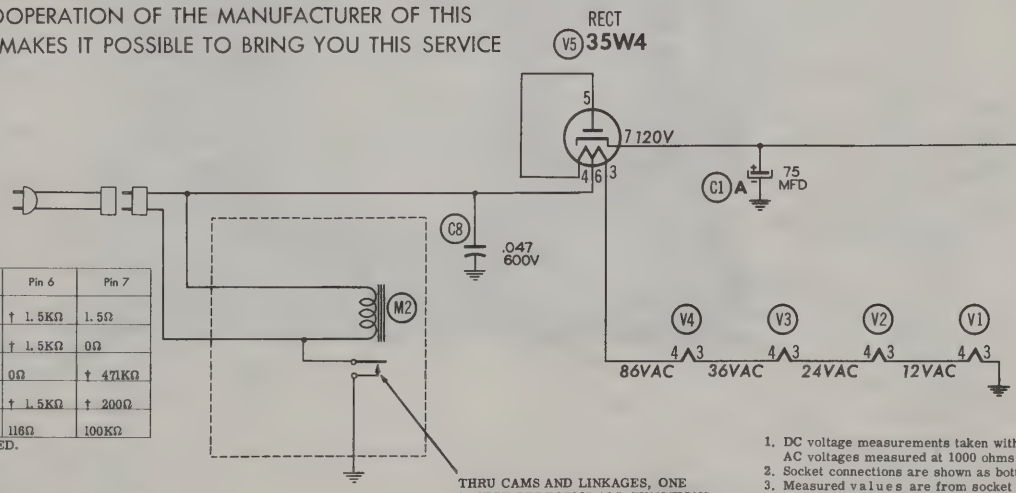


CHASSIS-TOP VIEW



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	2.2Meg	0Ω	24Ω	12Ω	† 1.5KΩ	† 1.5KΩ	1.5Ω
V 2	12BA6	2.7Meg	0Ω	24Ω	36Ω	† 1.5KΩ	† 1.5KΩ	0Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	500KΩ	0Ω	† 471KΩ
V 4	50C5	180Ω	470KΩ	36Ω	86Ω	470KΩ	† 1.5KΩ	† 200Ω
V 5	35W4	NC	TP	86Ω	121Ω	121Ω	116Ω	100KΩ

ALL MEASUREMENTS TAKEN WITH CLOCK DISCONNECTED.
† MEASURED FROM PIN 7 OF V5.
NC-NO CONNECTION.
TP-TIE POINT.

THRU CAMS AND LINKAGES, ONE SWITCH PERFORMS ALL FUNCTIONS OF OFF, ON, AUTO., AND SLEEP.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PROPERTY OF
L F BLANKENSHIP
3871 MEADE ST.
DENVER, COLORADO

GUILD
MODEL 484

TRADE NAME	Guild Model 484
MANUFACTURER	Guild Radio & Television Co., 460 N. Eucalyptus Ave., Inglewood, Calif.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1720KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to antenna stator lug on tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully closed	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. Repeat process until no further increase is noted.
2.	100MMF	High side to antenna clip on antenna. Low side to chassis.	1600KC	1600KC	"	A5	Adjust for maximum output.
3.	"	"	1500KC	Tune to 1500KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		GUILD PART No.	STANDARD REPLACEMENT	
V1	Converter	12BE6	12BE6	
V2	IF Amplifier	12BA6	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	12AV6	
V4	Output	50C5	50C5	
V5	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	GUILD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150		PRS150V3050	BBRD5315	TCD497	TDL-5030-150	MTD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	GUILD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	470			BPD-00047	DD-471	KO60	831-471	UC-5347	5GA-T47	
C3	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C4	50			SI50	D6-500	TP30	GP1K-500	UC-545	5GA-Q5	
C5	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C6	200			SI200	D6-201	TP38	GP2K-201	UC-532	5GA-T2	
C7	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C8	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C9A	5000									
B	250			♦ PA112-1	♦ PC-70	♦ 112TM1	♦ 1406-01		♦ T-3	
C										
C10	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C11	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C12	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	

♦ Items C9A, C9B, C9C, R7A and R7B are combined in one unit. When replacing items separately, C9B and C9C should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GUILD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½		AB-60	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft			AK-3	FS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch			KB-1	SWE-12	76-1	US-26	Attach to R1A.
R2	500KΩ	½						Tone & Phono Switch

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GUILD PART No.	IRC PART No.	
R3	22KΩ	½		BTS-22K	
R4	150Ω	½		BTS-150	
R5	1.8Meg 5%	½		BTS-1.8Meg 5%	
R6	6.8Meg	½		BTS-6.8Meg	

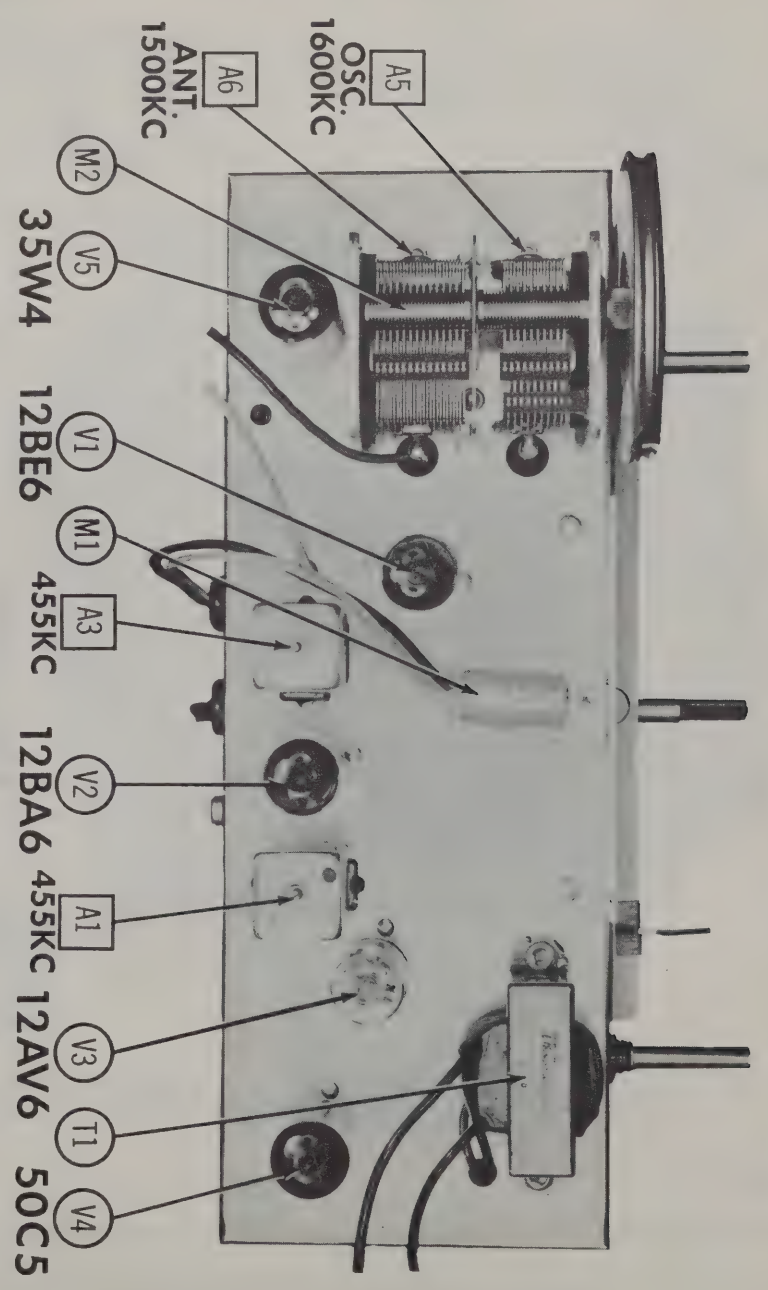
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GUILD PART No.	IRC PART No.	
R7A	500KΩ		♦	BTS-470K	
B	500KΩ			BTS-470K	
R8	150Ω	½		BTS-150	
R9	1000Ω	1		BTA-1000	
R10	150Ω	½		BTS-150	

♦ Items R7A, R7B, C9A, C9B, C9C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	GUILD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.6Ω	3.4Ω		Z1001	A3025 ①	A3876	22S45	S-1X	① Drill one new mtg. hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

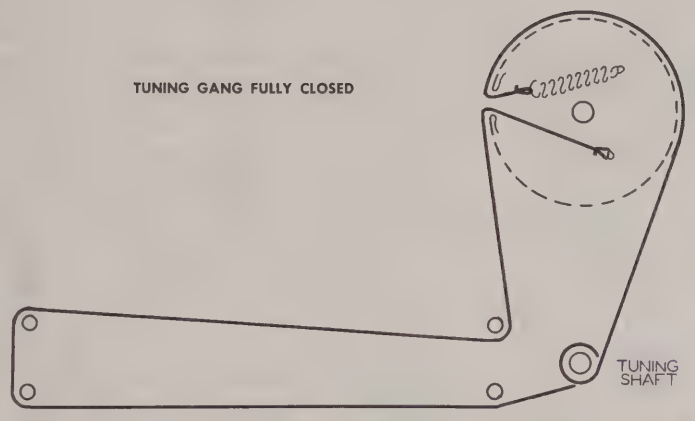
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	GUILD PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4½"	PM	3.4Ω				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	GUILD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.8Ω						Tapped ② .7Ω
L2	Osc. Coil	1Ω	8.7Ω		14-1074	BC-394	70-Osc.	
L3	Input IF	13Ω	13Ω	TRI-455-1	16-6758	BC-352	12-C1	
L4	Output IF	13Ω	13Ω	TRI-455-2	16-6758	BC-353	12-C2	

MISCELLANEOUS

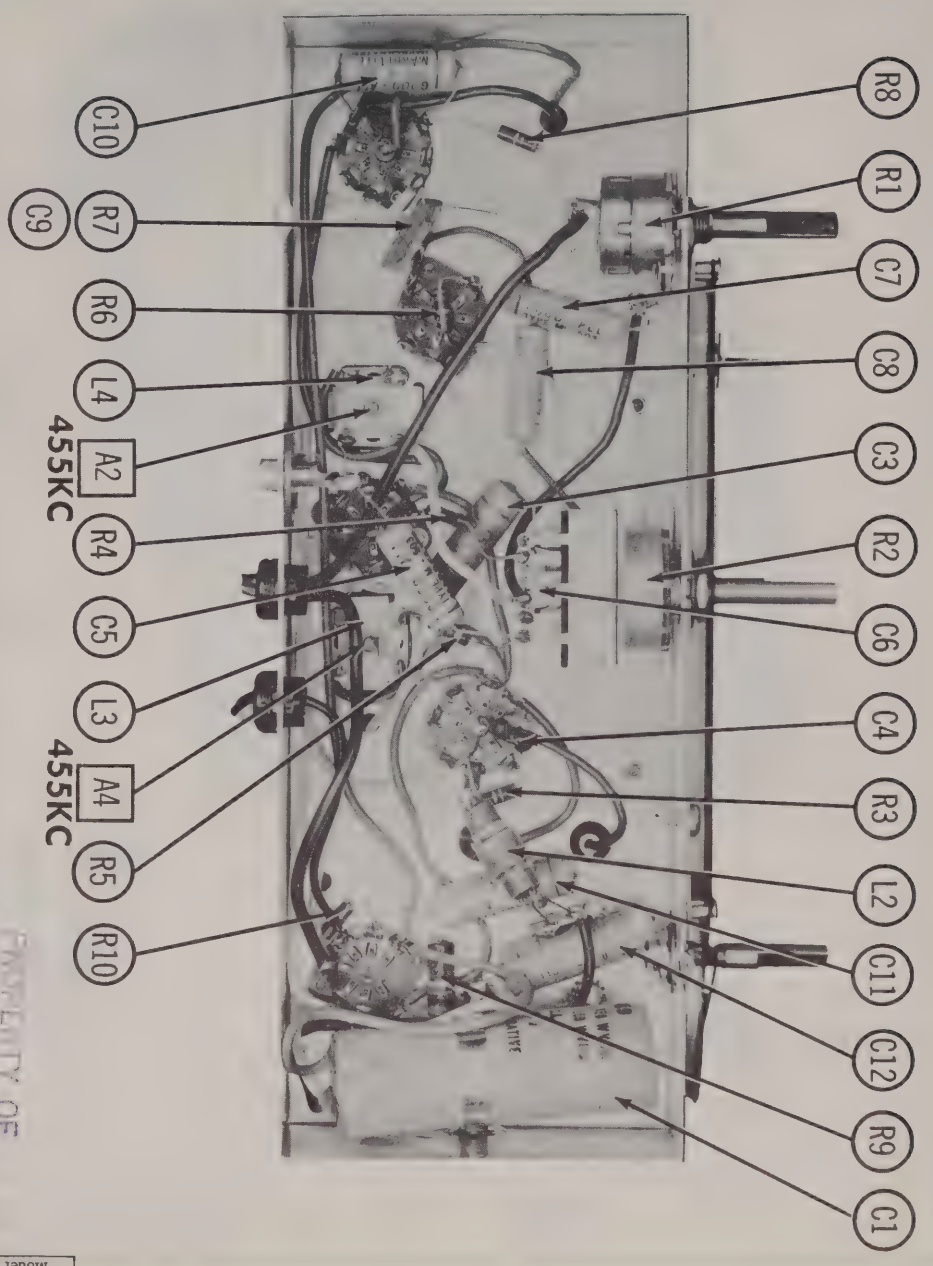
ITEM No.	PART NAME	GUILD PART No.	NOTES
M1	Dial Light		#47
M2	Tuning Cap.	2080	2 Gang (30-515MMF, 24-190MMF)

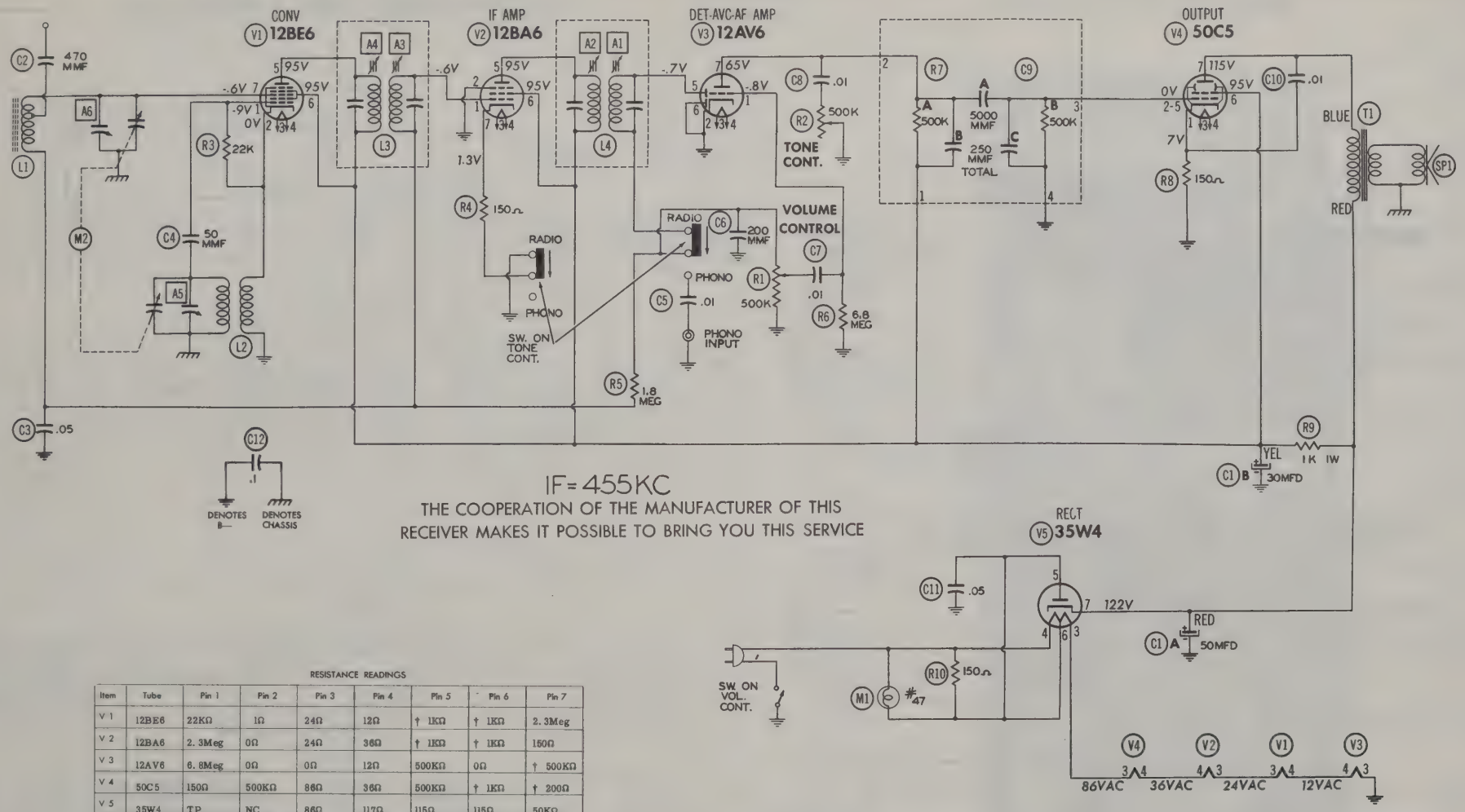


DIAL CORD STRINGING

PROPERTY OF
L. F. KLEINKNECHT
3944 MEADE ST.
DENVER, COLORADO

CHASSIS—BOTTOM VIEW





IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1Ω	24Ω	12Ω	† 1KΩ	† 1KΩ	2.3Meg
V 2	12BA6	2.3Meg	0Ω	24Ω	36Ω	† 1KΩ	† 1KΩ	150Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	500KΩ	0Ω	† 500KΩ
V 4	50C5	150Ω	500KΩ	86Ω	36Ω	500KΩ	† 1KΩ	† 200Ω
V 5	35W4	TP	NC	86Ω	117Ω	115Ω	115Ω	50KΩ

ALL MEASUREMENTS TAKEN IN RADIO POSITION.
† MEASURED FROM PIN 7 OF V5.
TP-TIE POINT.
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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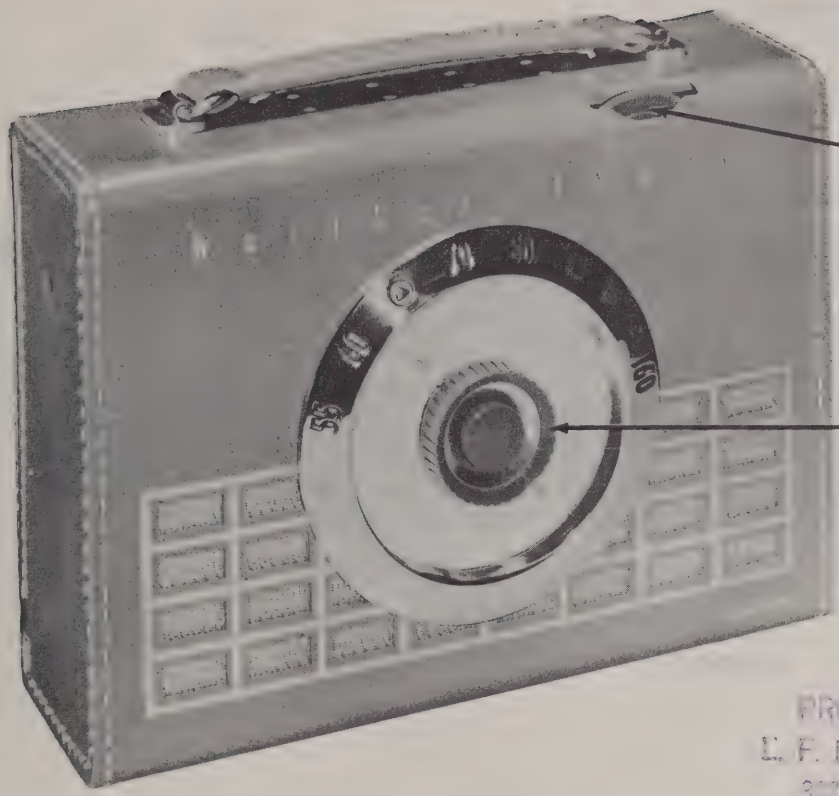
HALLICRAFTERS MODELS
TW-100, TW-101, TW-102



PROPERTY OF
L. F. BLANKENSHIP
3021 MEADE ST.
DENVER, COLORADO

HALLICRAFTERS MODELS
TW-100, TW-101, TW-102

TRADE NAME	Hallicrafters Models TW-100, TW-101, TW-102
MANUFACTURER	Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amp., 1U5 Det. -AVC-AF Amp., 3V4 Output
POWER SUPPLY	110-120 Volts AC-DC (or) 3 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	.15 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 8.5MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	535KC-1680KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop (Radiated)	1640KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal	"	A6	Adjust for maximum output. Check for calibration and tracking.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		Hallicrafters PART No.	STANDARD REPLACEMENT	
V1	Converter	1R5	1R5	
V2	IF Amp.	1U4	1U4	
V3	Det. -AVC-AF Amp.	1U5	1U5	
V4	Output	3V4	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Hallicrafters PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	150	45-321	AFH4-22	DO23	FP407.5	TM-4055	Q-080	
B	■40	150							
C	200	10							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400	46-345	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	10000		47-582	BPD-01	DD-103	KO82	811-01	DC-511	5HK-S1	
C4	3000		47-584	BPD-003	DD-302	KO76	811-003	UC-523	5HK-D3	
C5A	150		♦ 49-064							
B	2000									
C	150									
D	10000									
E	5000									
C6	5000		47-585	BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C7	20000		47-583	BPD-02	DD-203	KO85	817-02		5HK-S2	
C8	.047	400	46BR473L4	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C9	.1	400	46-346	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	

♦ Items C5A, C5B, C5C, C5D, C5E, R6A, R6B, R6C and R6D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Hallicrafters PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	25-1213	B-70-S	A47-2Meg-Z	Q13-139	U-55	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	Not Req.	SWE-20	76-2	US-27	Attach to R1A.

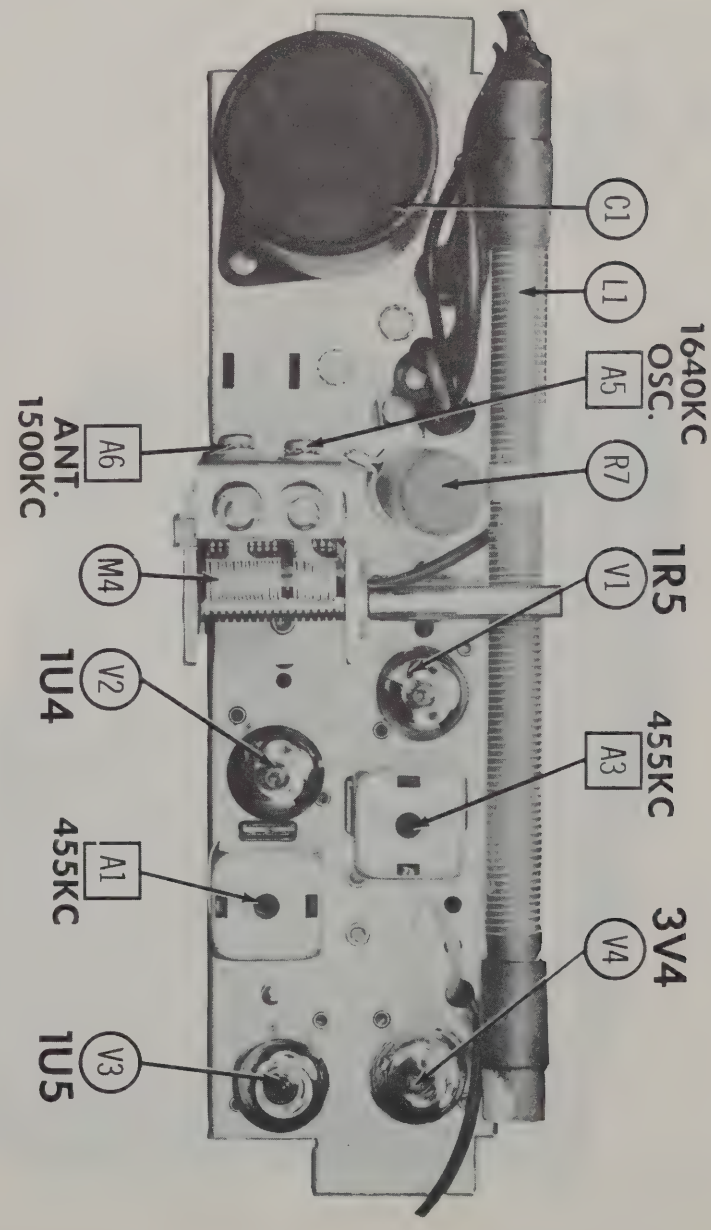
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R2	100K	½	23X20X104K	BTS-100K	
R3	15K	½	23X20X153M	BTS-15K	
R4	3.3Meg	½	23X20X355M	BTS-3.3Meg	
R5	3.3Meg	½	23X20X355M	BTS-3.3Meg	
R6A	4.7Meg	½	♦ 49-064	BTS-4.7Meg	
B	4.7Meg	½		BTS-4.7Meg	
C	1Meg	½		BTS-1Meg	
D	2.2Meg	½		BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R7A	68	2	† 24-1056		
B	2300	10			
R8	3300Ω	½	23X20X332M	BTS-3300	
R9	270Ω	½	23X20X271M	BTS-270	
R10	820Ω	½	23X20X281K	BTS-820	
R11	27Ω	½	23X20X270K	BTS-27	
R12	270Ω	½	23X20X271M	BTS-270	
R13	470Ω	½	23X20X471M	BTS-470	
R14	220K	½	23X20X224M	BTS-220K	

♦ Items R6A, R6B, R6C, R6D, C5A, C5B, C5C, C5D and C5E are combined in one unit.
† Items R7A, R7B are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Hallicrafters PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	9.2KΩ	3.4Ω	Part of spkr.		A-2927	A-3329	24S49	S-11X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA Hallicrafters PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	3½"	PM	3.4Ω	85-185	3A07		

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	1.4Ω		57-214				
L2	Osc. Coil	4.1Ω	12.5Ω	51-2022	14-1073		69-Osc.	
L3	Input IF	20Ω	20Ω	50-686	16-6758	BC-352	12-C1	
L4	Output IF	27Ω	26Ω	50-687				Tapped @ 1Ω

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA Hallicrafters PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.060A	27-22	1003A	RS075	6S75	5M4	75	

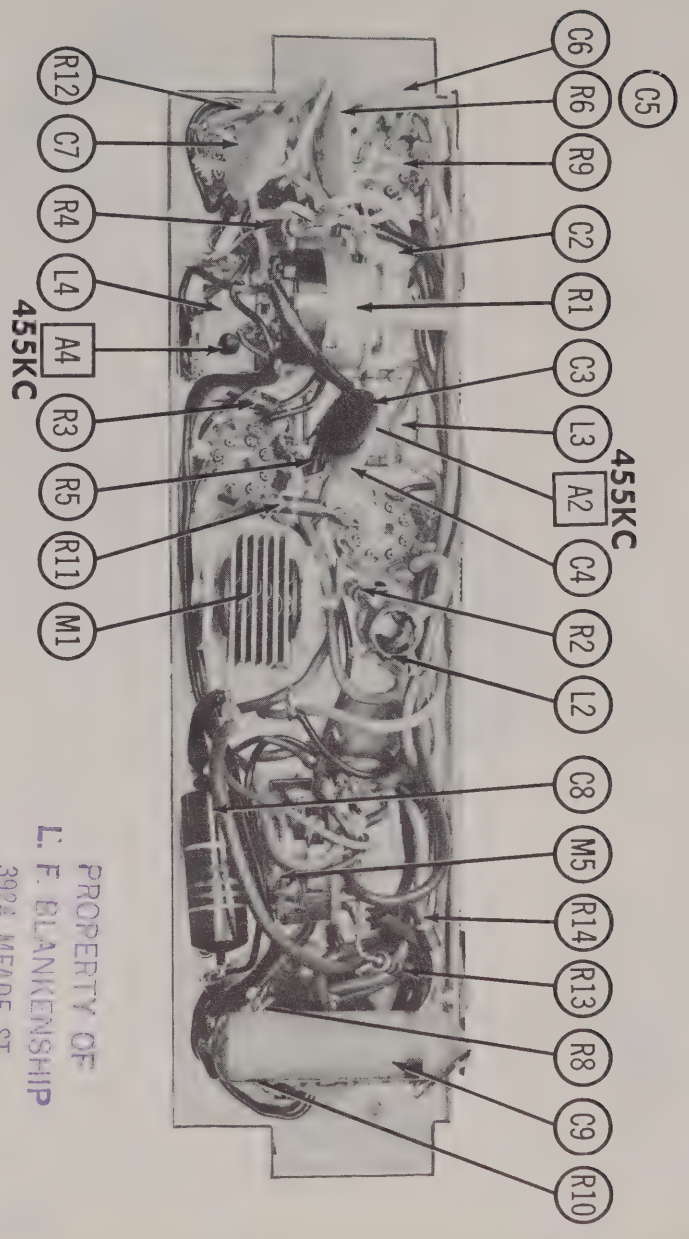
BATTERIES

ITEM No.	VOLTAGE	Hallicrafters PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	1.5V"A"		950			2R			Connect 2 in series
M3	67.5V"B"			477			P45		

MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M4	Tuning Cap.	48-367	2 Gang (10-240MMF, 12-115MMF)
M5	Switch	60-734	Power Changeover (5P-2Position-Rotary, Wafer Type)
	Knob	15-907	Tuning
	Knob	15-908	On-off-volume
	Dial Face Plate	7-622	

CHASSIS—BOTTOM VIEW



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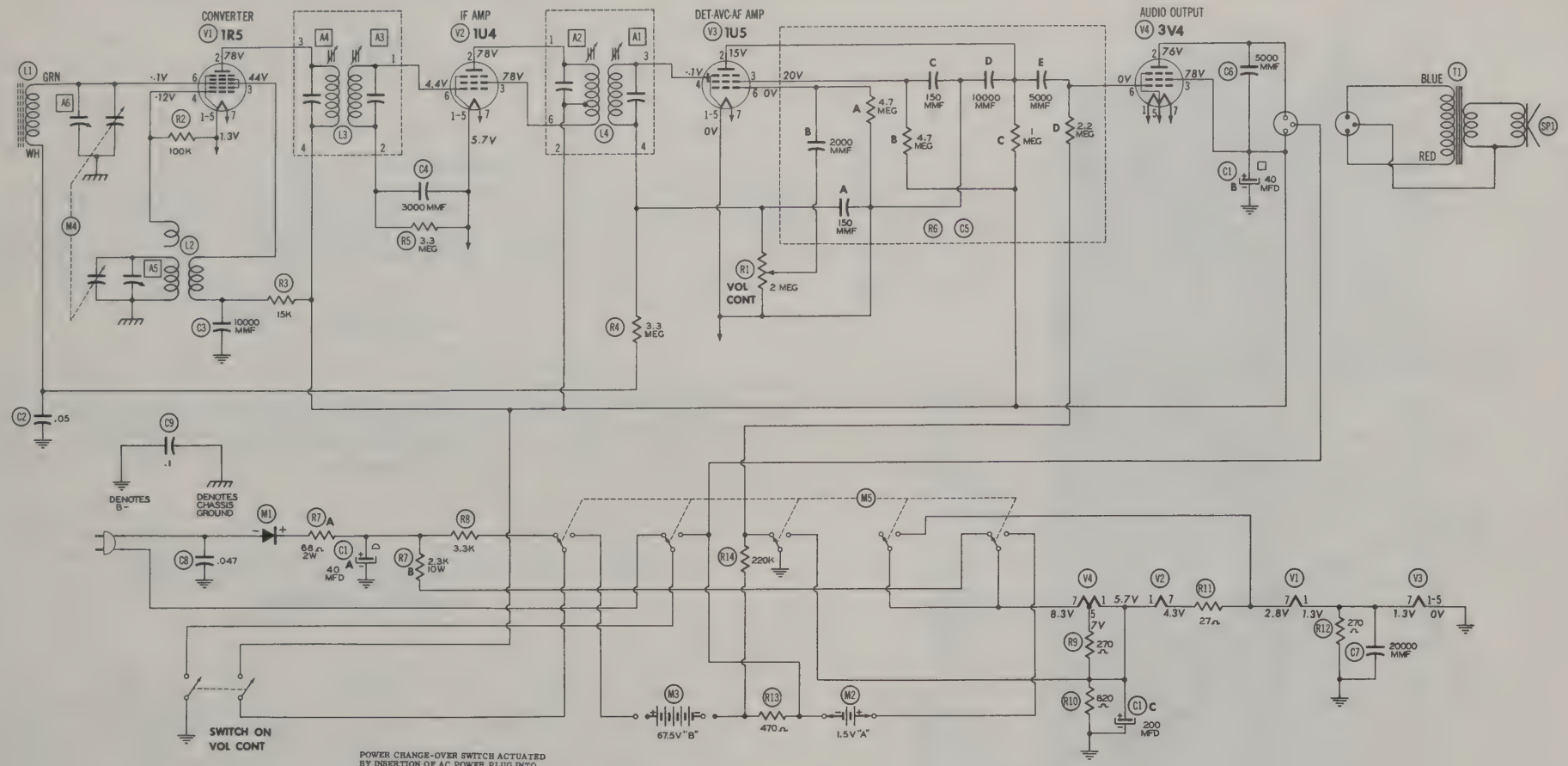
HALLICRAFTERS
Model TW-100



POWER CHANGE-OVER SWITCH ACTUATED BY INSERTION OF AC POWER PLUG INTO RECEPTACLE ON CHASSIS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	18Ω	† 3.3KΩ	† 18.3KΩ	100KΩ	18Ω	5.3Meg	28Ω
V 2	1U4	60Ω	† 3.3KΩ	† 3.3KΩ	TP	60Ω	3.3Meg	50Ω
V 3	1U5	0Ω	† 1Meg	† 4.7Meg	2Meg	0Ω	4.7Meg	18Ω
V 4	3V4	60Ω	† 3.6KΩ	† 3.3KΩ	TP	70Ω	2.2Meg	80Ω

† MEASURED FROM OUTPUT OF M1.
TP-TIE POINT.

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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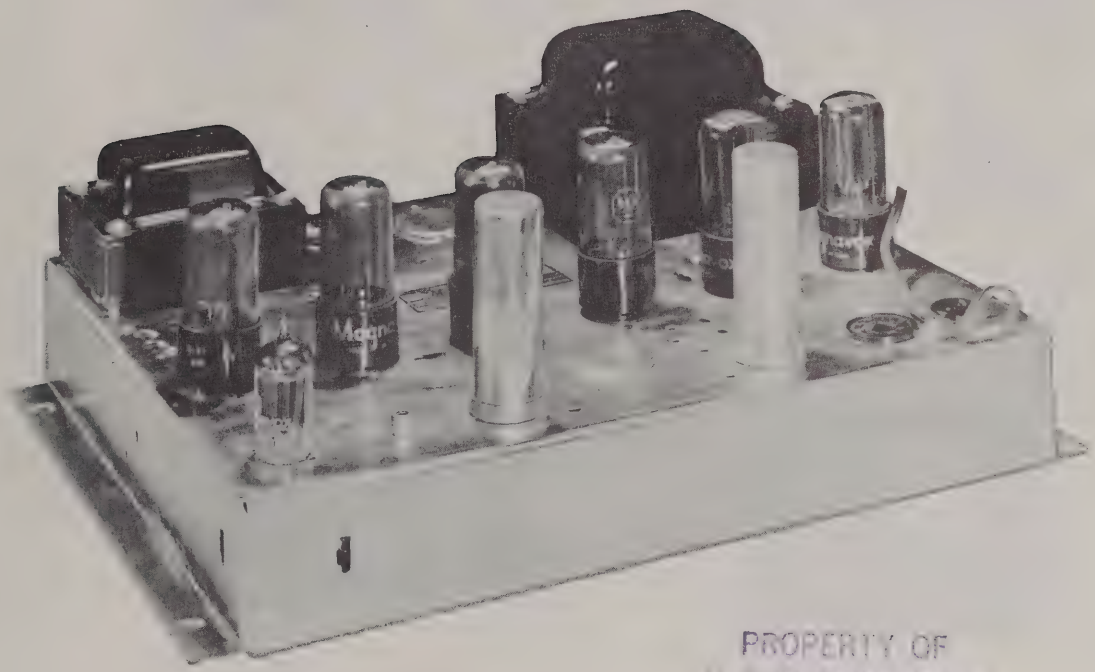
MAGNAVOX
CHASSIS AMP-142AB



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MAGNAVOX
CHASSIS AMP-142AB

TRADE NAME	Magnavox Chassis Amp -142AB
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne, Ind.
TYPE SET	AC Operated 20 Watt Audio Amplifier
TUBES (Seven)	Types 12AX7 AF Amp. -Phase Inv., (4) 6V6GT Output, (2) 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-50-60 Cycles RATING 1.26 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

MAGNAVOX
Chassis Amp-142AB

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		MAGNAVOX PART No.	STANDARD REPLACEMENT	
V1	AF Amp. -Phase Inv.	12AX7	12AX7	
V2	Audio Output	6V6GT	6V6GT	
V3	Audio Output	6V6GT	6V6GT	
V4	Audio Output	6V6GT	6V6GT	
V5	Audio Output	6V6GT	6V6GT	
V6	Rect.	5Y3GT	5Y3GT	
V7	Rect.	5Y3GT	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 30	475	270023-2			FP259	TM-3010-450	S-295	
B	▲ 10	475						FM-4710	
C2A	■ 30	475	270023-2			FP259	TM-3010-450	S-295	
B	▲ 10	475	475					FM-4710	
C3	20	25	270027-2	PRS25V25	BR202	TC26	TD-25-25	FM-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C5	.1	600	250201-13	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C6	.1	600	250201-13	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C7	.0022	600	250201-3	SI2200	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C8	10000	1000	250219-2		DD-103				10HK-S1	
C9	10000	1000	250219-2		DD-103				10HK-S1	
C10	10000			BPD-01	DD-103	KO82	811-01	DC-511	5HK-S1	Note 1

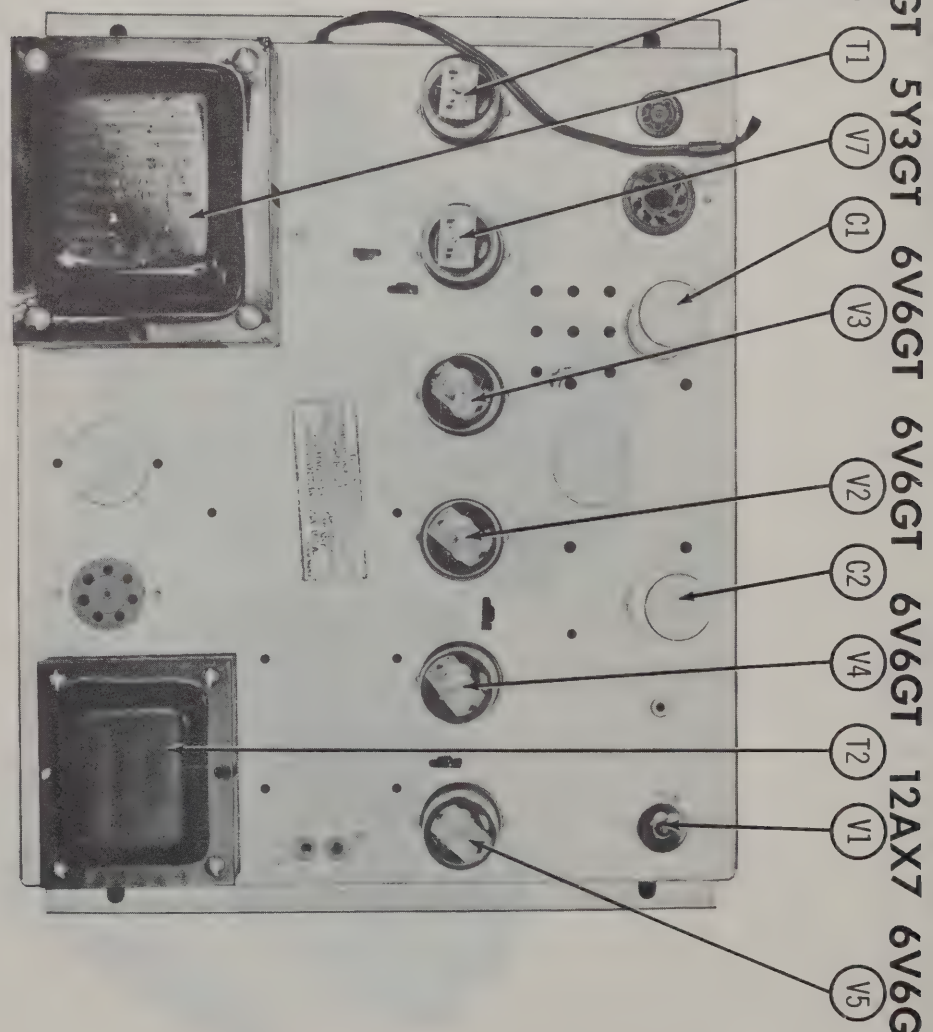
Note 1. Not used in some versions.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R1	470K	½	230104-94	BTS-470K	
R2	470K	½	230104-94	BTS-470K	
R3	3300Ω	½	230104-68	BTS-3300	
R4	220	½	230104-54	BTS-220	
R5	20K 5%	½	230094-190	BTS-20K 5%	
R6	470K	½	230104-94	BTS-470K	
R7	100K	1	230105-86	BW-1-100K	
R8	8200Ω	½	230104-73	BTS-8200	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R9	220K	½	230104-90	BTS-220K	
R10	100Ω	½	230104-50	BTS-100	
R11	220K	½	230104-90	BTS-220K	
R12	100Ω	½	230104-50	BTS-100	
R13	125Ω	10	240021-11		
R14	2700Ω	½	230104-67	BTS-2700	
R15	100Ω	½	230104-50	BTS-100	
R16	100Ω	½	230104-50	BTS-100	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ③ 1.26A	574VCT .190ADC	5VAC ③ 4A	6.3VAC ③ 4.64A ②	300071-1		P-3077	P-8332 ①		

① Tape 6.3V ③ 1.2A, and .9A windings.
② Current reading on Sec. #3 will increase when tuner is added.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	3.7KΩ	4.3Ω Tap③ .38Ω RES.	330024-1F 330024-1 ①						① Alternate Audio Output

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	RF Choke	0Ω		360575-1	19-1002		4606	2 Microhenries
L2	RF Choke	0Ω		360575-1	19-1002		4606	2 Microhenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L3	.190A	51Ω	1HY	320041-2	C5040	C-2996 ①	C2327	26C41	C-21X ①

① Drill one new mounting hole.

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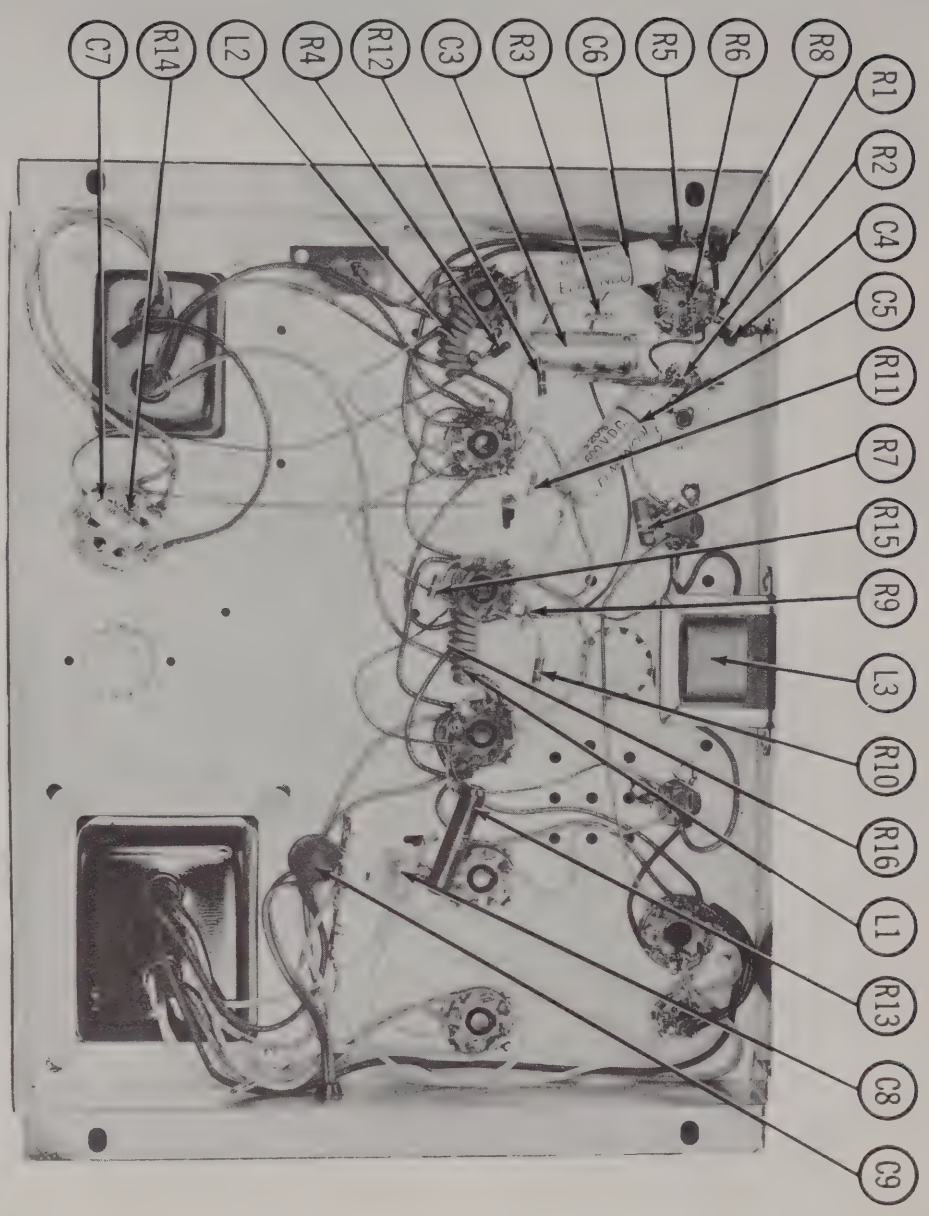
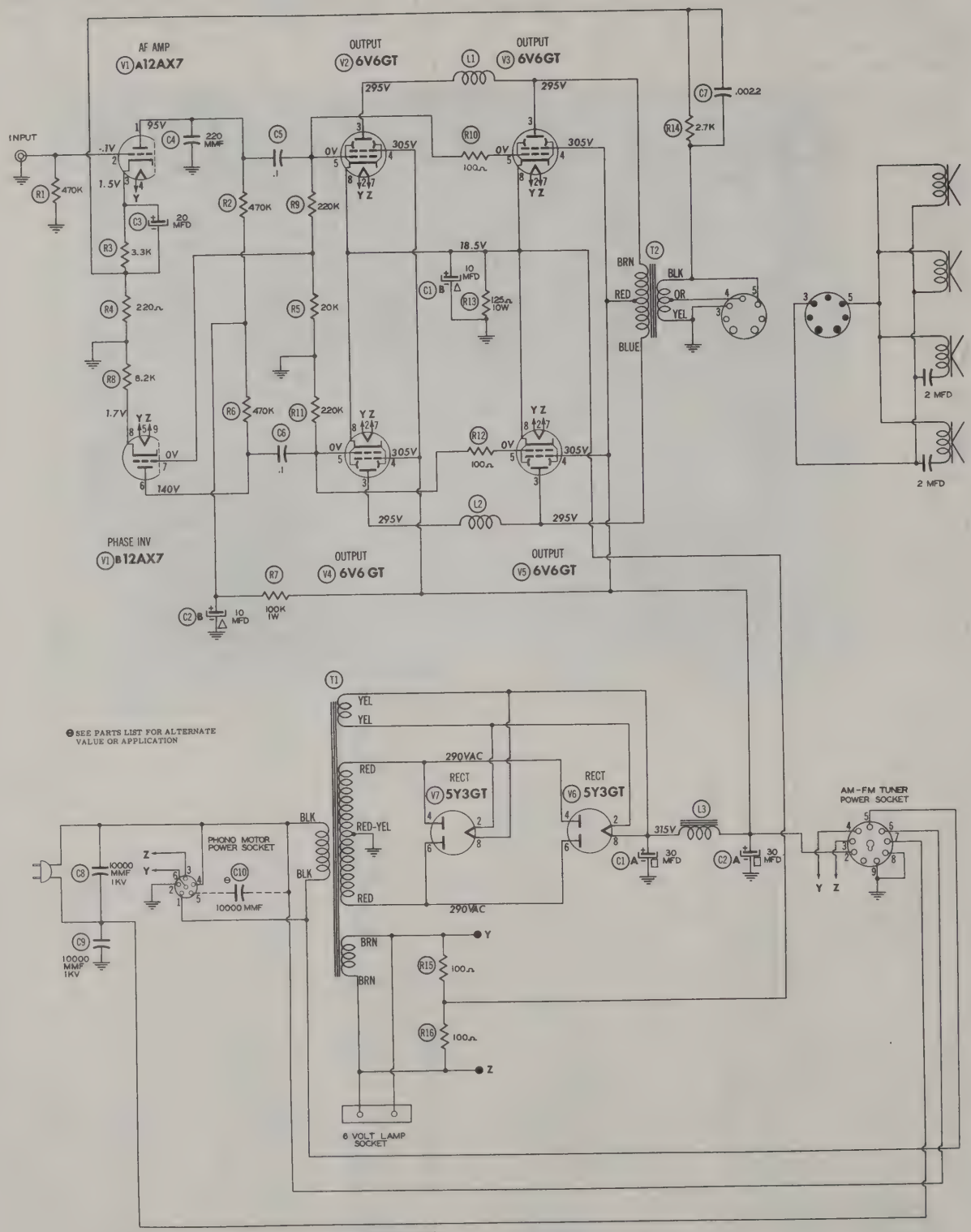
DENVER, COLORADO

CHASSIS—BOTTOM VIEW



MAGNAVOX
Chassis Amp-142AB



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	↑ 570KΩ	470KΩ	3.5KΩ	175Ω	175Ω	↑ 570KΩ	20KΩ	8.2KΩ	175Ω
V 2	6V6GT	NC	175Ω	↑ 150Ω	↑ 50Ω	240KΩ	TP	175Ω	125Ω	
V 3	6V6GT	NC	175Ω	↑ 150Ω	↑ 50Ω	240KΩ	NC	175Ω	125Ω	
V 4	6V6GT	NC	175Ω	↑ 150Ω	↑ 50Ω	220KΩ	TP	175Ω	125Ω	
V 5	6V6GT	NC	175Ω	↑ [illegible]	↑ 50Ω	220KΩ	NC	175Ω	125Ω	
V 6	5Y3GT	NC	70KΩ	NC	22Ω	NC	22Ω	NC	70KΩ	
V 7	5Y3GT	NC	70KΩ	NC	22Ω	NC	22Ω	NC	70KΩ	

↑ MEASURED FROM PIN 8 OF V7.
NC-NO CONNECTION.
TP-TIE POINT.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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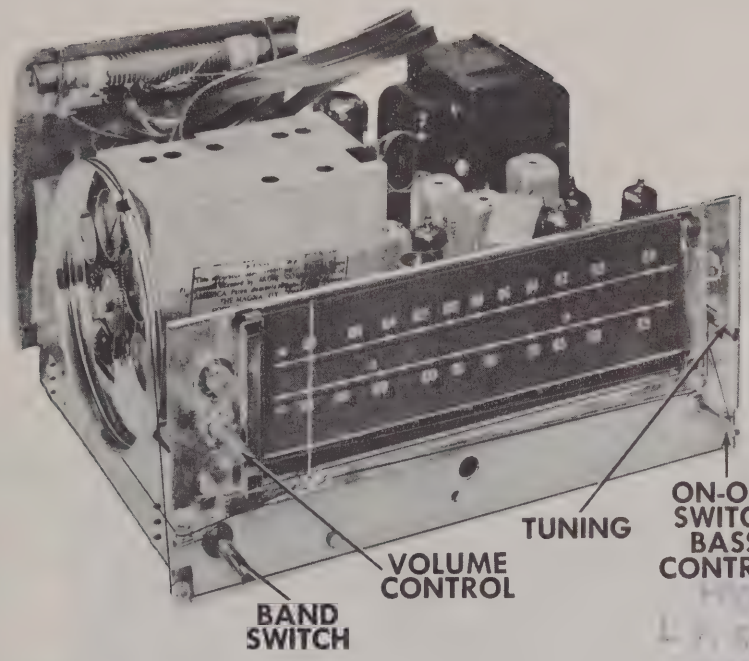
MAGNAVOX
CHASSIS CR-714AA



PROPERTY OF
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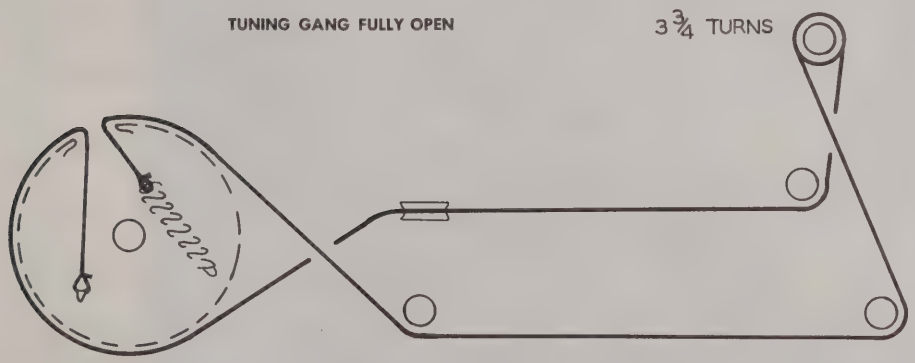
[illegible] MEADE ST.
DENVER, COLORADO

TRADE NAME	Magnavox Chassis CR-714AA		
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne, Ind.		
TYPE SET	AC Operated AM-FM Superheterodyne Receiver		
TUBES (Ten)	Types 6BZ6 FM RF Amp., 6U8 FM Mixer-Osc., 6BE6 AM Converter, 6BA6 1st FM-AM IF Amp., 6BA6 2nd FM IF Amp., 6AL5 Ratio Det., 12AX7 AF Amp. -Phase Inv., (2) 6AQ5 Output, 5Y3GT Rect.		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	.71Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540KC-1620KC	FREQ. MOD.	88MC-108MC



DIAL CORD STRINGING

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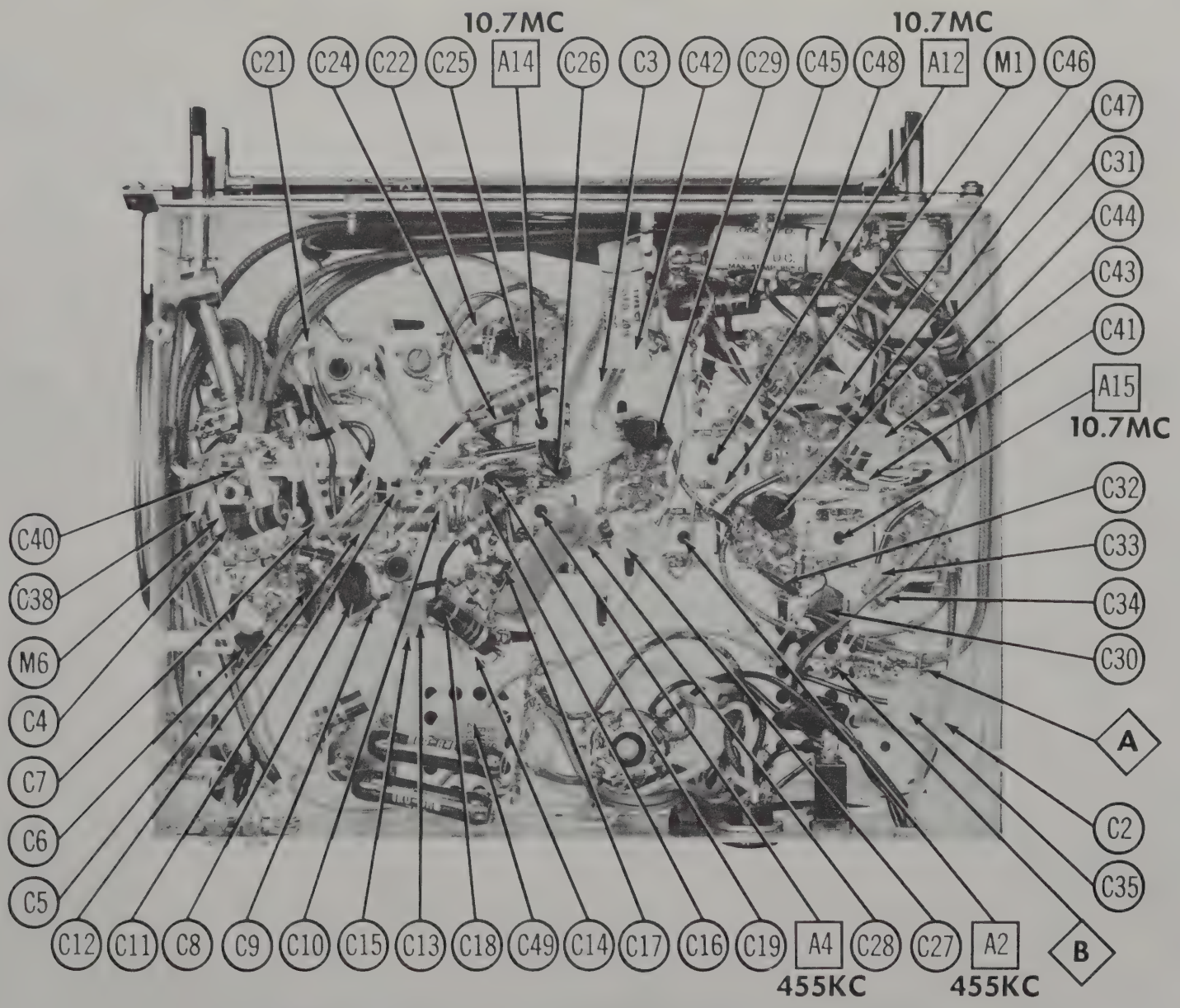
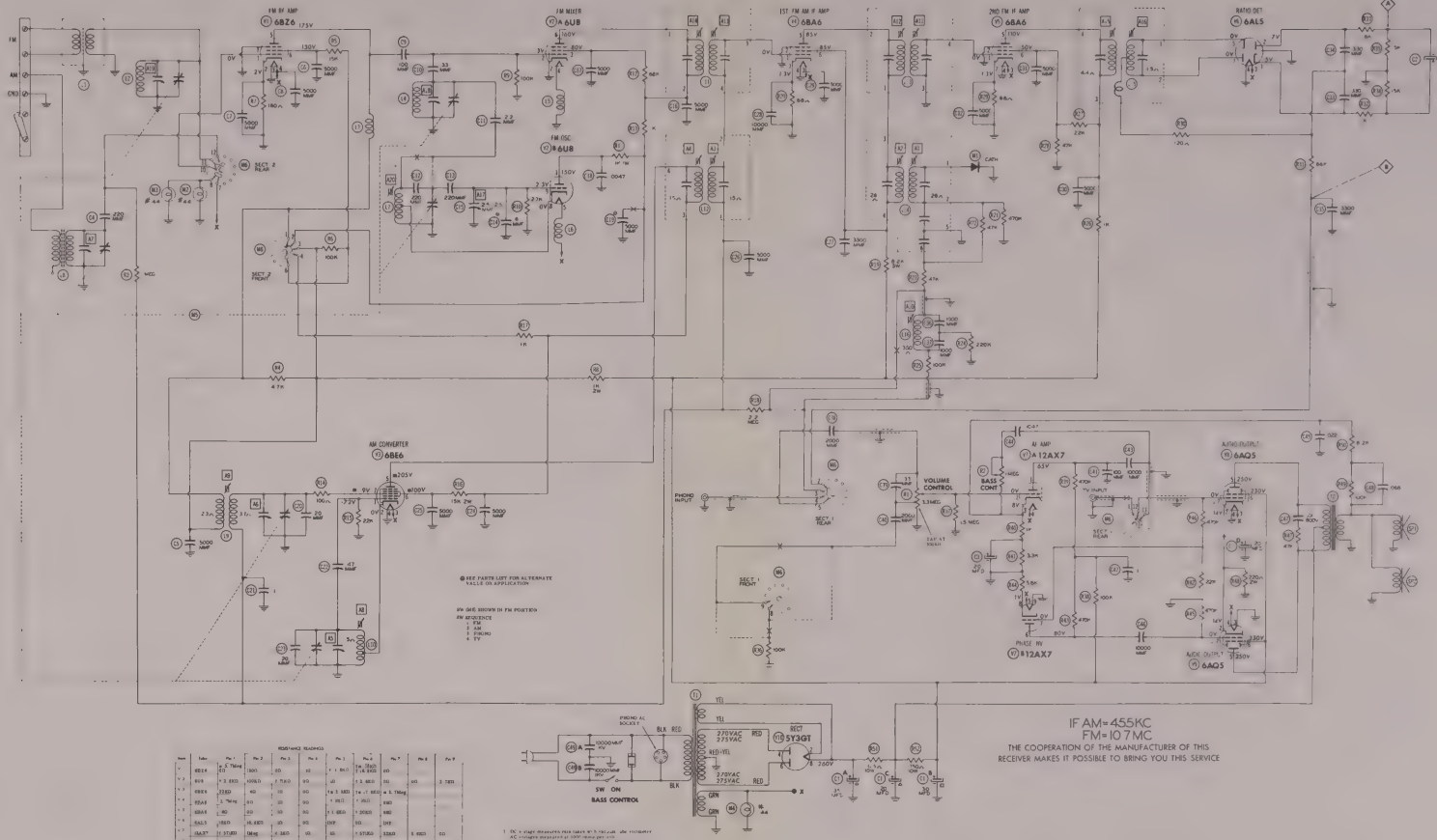


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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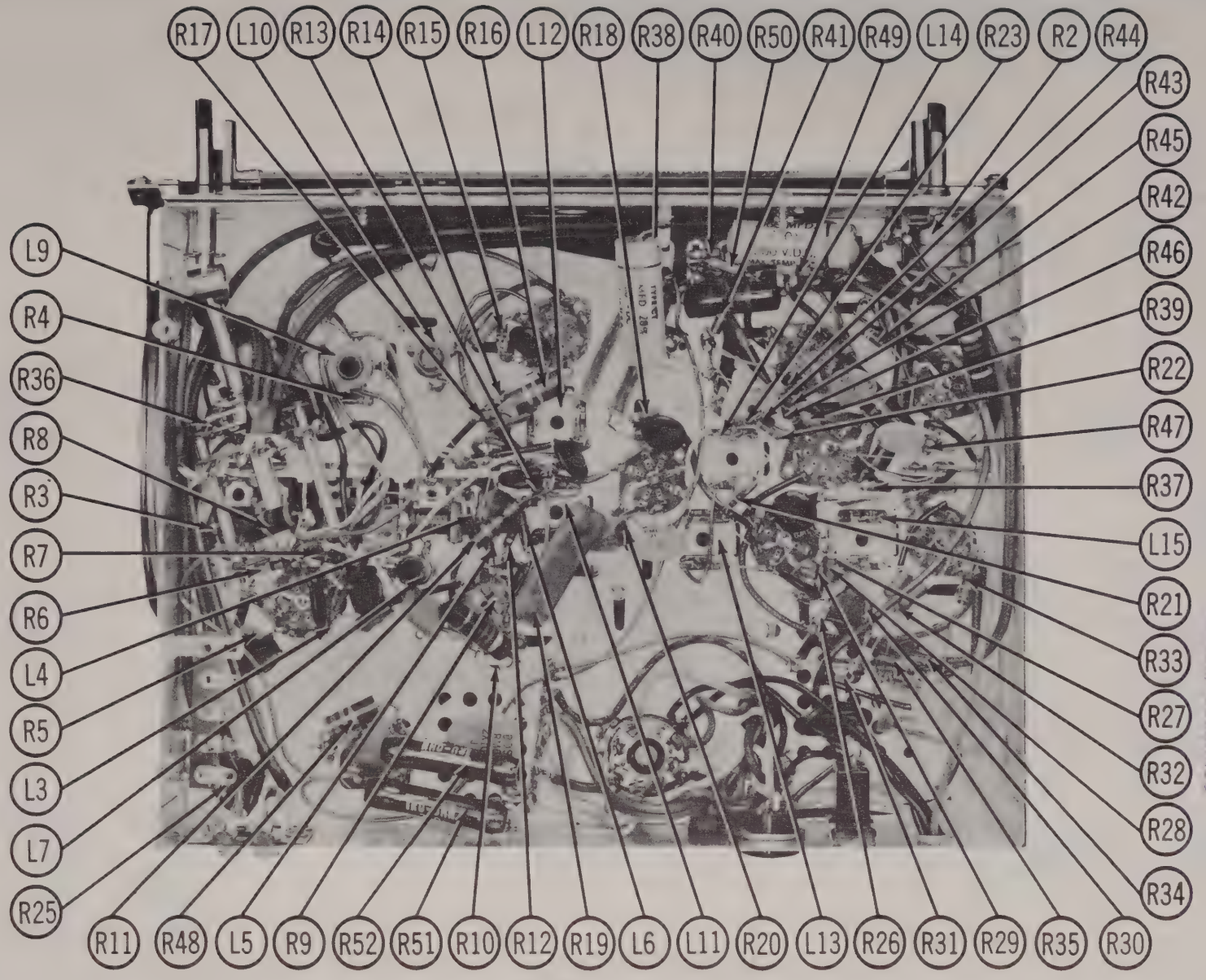

PROPERTY OF
L. F. HUMKENSHIP
3020 MAUDE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MAGNAVOX
CHASSIS CR-714AA

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
With tuning gang closed, line up pointer with last dial calibration mark at low frequency end of dial.
Treble control to sharp tune.
Keep signal generator output as low as possible.

AM IF ALIGNMENT

Set band switch to AM.
Check dial pointer.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400∿ Mod.)	AM	1000KC	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output.
2.	10MMF	High side to AM Ant. terminal. Low side to chassis.	1400KC	"	1400KC	"	A5, A6, A7	"
3.	"	"	600KC	"	600KC	"	A8, A9	"

WHISTLE FILTER ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	High side to AM antenna terminal. Low side to chassis.	10KC	AM	Any	AC probe across Audio Output	A10	Adjust for minimum deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set band switch to FM.
Use 1Meg resistor in series with DC probe of VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.01MFD	High side to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Low frequency end of dial	DC probe thru 1Meg to point (A). Common to chassis.	A11, A12, A13, A14, A15	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe thru 1Meg to point (B). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
7.	"	"	10.625KC	"	"	"	A15	Adjust for equal peaks of opposite polarity similar to Fig. 1.
8.	"	"	10.775MC	"	"	"	"	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
Use 1Meg resistor in series with high side of scope.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Low frequency end of dial	Vert. Amp. thru 1Meg to point (A). Low side to chassis.	A11, A12, A13, A14, A15	Disconnect stabilizing capacitor (C2). Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
6.	"	"	"	"	"	Vert. Amp. thru 1Meg to point (B). Low side to chassis.	A16	Reconnect stabilizing capacitor (C2). Adjust so that 10.7MC occurs at center of cross-over line similar to Fig. 3. SLIGHTLY retouch A15 for maximum amplitude and straightness of crossover lines. Proceed with step 9.

FM RF ALIGNMENT

Use 1Meg resistor in series with DC probe of VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.		High side thru 120Ω to FM antenna terminal. Low side thru 150Ω to chassis.	107MC	FM	107MC	DC probe thru 1Meg to point (A). Common to chassis.	A17, A18, A19	Adjust for maximum deflection.
10.		"	89MC	"	89MC	"	A20	"

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DENVER, COLORADO

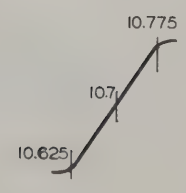


FIG. 1

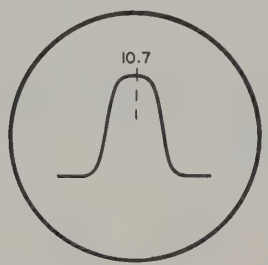


FIG. 2

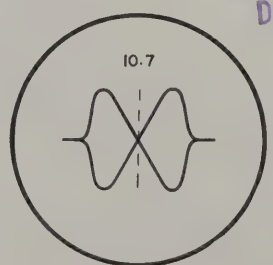


FIG. 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		MAGNAVOX PART No.	STANDARD REPLACEMENT	
V1	FM RF Amp.	6BZ6	6BZ6	
V2	FM Mixer-Osc.	6U8	6U8	
V3	AM Converter	6BE6	6BE6	
V4	1st FM-AM IF Amp.	6BA6	6BA6	
V5	2nd FM IF Amp.	6BA6	6BA6	
V6	Ratio Det.	6AL5	6AL5	
V7	AF Amp. -Phase Inv.	12AX7	12AX7	
V8	Output	6AQ5	6AQ5	
V9	Output	6AQ5	6AQ5	
V10	Rectifier	5Y3GT	5Y3GT	

ELECTROLYTIC CAPACITORS

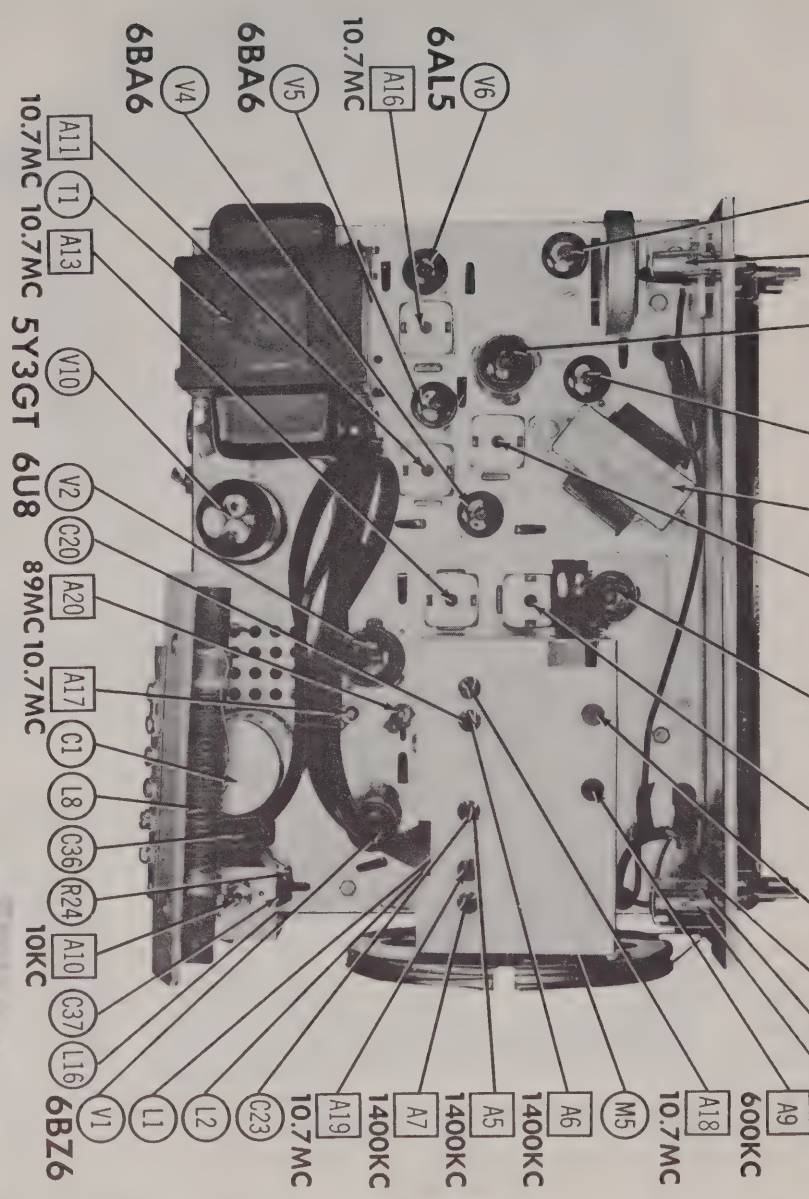
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲35	450	270021-59	AFH4-79	C102	FP345.3	TM-4138	Q-380	TVL-3741
B	▲30	450			BR4045	TC77		MT-4510	TVA-1712
C	■30	450							
D	20	25							
C2	4	50	270027-27	PRS150V4	BR550	TC30	TD-4-50	MT-1504	TVA-1303
C3	20	25	270027-2	PRS25V25	BR202	TC45	TD-25-25	MT-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	220	500	250187-57	NPO-SI220	TCZ-220	5R5T22	NPO-335-221		MS-322	
C5	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C6	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C7	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C8	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C9	100	500	250187-53	NPO-SI100	TCZ-100	5R5T1	NPO-337-101	MCB235	MS-31	
C10	33	500	250187-47	NPO-SI33	TCZ-33	5R5Q33	NPOL-330	ZT-5433	MS-433	
C11	2.2		250221-118	NPO-SI2.2	TCZ-2R2	TZ05	NPOA-2R2		5TCCB-V2	
C12	220	500	250159-55	NPO-SI220	TCZ-220	5R5T22	NPO-335-221		MS-322	
C13	220	500	250159-55	NPO-SI220	TCZ-220	5R5T22	NPO-335-221		MS-322	
C14	6									Note 1
C15	2.5-12.5		250188-9							
C16	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C17	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C18	.0047	400	250211-5	SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C19	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	Note 2
C20	20	500	250187-5	NPO-SI20	TCZ-20	5R5Q2	NPOK-200	ZT-542	MS-42	
C21	.1	200	250202-13	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C22	47	500	250187-49	NPO-SI47	TCZ-47	5R5Q47	NPO-338-470	ZT-5447	MS-447	
C23	20	500	250187-5	NPO-SI20	TCZ-20	5R5Q2	NPOK-200	ZT-542	MS-42	
C24	5000		250175-1	BPD-005	DD-502	KO80	811-05	DC525	5HK-D5	
C25	5000		250175-1	BPD-005	DD-502	KO80	811-05	DC525	5HK-D5	
C26	5000		250175-1	BPD-005	DD-502	KO80	811-05	DC525	5HK-D5	
C27	3300		250175-28	1464-0033		1R5D33			MS-233	
C28	10000		250218-19	BPD-01	DD-103	KO82	811-01	DC511	5HK-S1	
C29	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C30	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C31	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C32	5000		250175-1	BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C33	330		250207-49	SI330	D6-331	TP27	GP2K-331	UC-5333	5GA-T33	
C34	330		250207-49	SI330	D6-331	TP27	GP2K-331	UC-5333	5GA-T33	
C35	3300		250175-28	1464-0033		1R5D33			MS-233	
C36	1000		250288-354					MCE255		
C37	1000		250288-354					MCE255		
C38	2000		250218-20	BPD-002	DD-202	KO72	801-002	DC522	5HK-D2	
C39	33		250218-21	N750-DI33	TCN-33	NO29	N750K-330	ZT-5533	5TCU-Q33	
C40	2000		250218-20	BPD-002	DD-202	KO72	801-002	DC522	5HK-D2	
C41	100		250218-22		TCL-100					
C42	.1	400	250211-13	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C43	10000		250201-7	BPD-01	DD-103	KO82	811-01	DC511	5HK-S1	

CHASSIS—TOP VIEW



DIVISION 3924 WABASH ST.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C44	.0047	400	250211-5	SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C45	.022	200	250202-9	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C46	10000		250201-7	BPD-01	DD-103	KO82	811-01	DC511	5HK-S1	
C47	.01	600	250201-7	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C48	.068	200	250202-12	P288N-068		CUB4S68			4TM-S68	
C49A	10000	1000	250219-3		DD16-103				10HK-S1	
B	10000	1000			DD16-103				10HK-S1	

Note 1. Some versions may use a 5MMF unit (Part No. 250088-138) in this application.
Note 2. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.3Meg	½	220074-10	ABT-8517	A47F-3Meg		UT-461	Volume Tap at 300KΩ
B	Shaft		Not Req.	AK-3	FS-3		Not Req.	Attach to R1A.
R2A	1Meg	½	220073-20	AB-70	A47-1Meg-Z	Q13-137	U-53	Bass
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R2A.
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R2A.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R3	1Meg	½	230104-98	BTS-1Meg	
R4	4700Ω	½	230104-70	BTS-4700	
R5	15KΩ	½	230104-76	BTS-15K	
R6	100KΩ	½	230104-86	BTS-100K	
R7	180Ω	½	230104-53	BTS-180	
R8	1000Ω	2	230106-62	BTB-1000	
R9	100KΩ	½	230104-86	BTS-100K	
R10	2700Ω	½	230104-67	BTS-2700	
R11	1000Ω	1	230105-62	BTA-1000	
R12	68KΩ	½	230104-84	BTS-68K	
R13	1000Ω	½	230104-62	BTS-1000	
R14	100Ω	½	230104-50	BTS-100	
R15	22KΩ	½	230104-78	BTS-22K	
R16	15KΩ	2	230106-76	BTB-15K	
R17	1000Ω	½	230104-62	BTS-1000	
R18	2.2Meg	½	230104-102	BTS-2.2Meg	
R19	8200Ω	5	240071-13	PW10-8200	
R20	68Ω	½	230104-48	BTS-68	
R21	470KΩ	½	230104-94	BTS-470K	
R22	47KΩ	½	230104-82	BTS-47K	
R23	47KΩ	½	230104-82	BTS-47K	
R24	220KΩ	½	230104-90	BTS-220K	
R25	100KΩ	½	230104-86	BTS-100K	
R26	1000Ω	½	230104-62	BTS-1000	
R27	22KΩ	½	230104-90	BTS-22K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R28	47KΩ	½	230104-82	BTS-47K	
R29	68Ω	½	230104-48	BTS-68	
R30	120Ω	½	230104-51	BTS-120	
R31	68KΩ	½	230104-84	BTS-68K	
R32	1000Ω	½	230104-62	BTS-1000	
R33	1800Ω	½	230104-65	BTS-1800	
R34	15KΩ	½	230104-76	BTS-15K	
R35	15KΩ	½	230104-76	BTS-15K	
R36	100KΩ	½	230104-86	BTS-100K	
R37	1.5Meg	½	230104-100	BTS-1.5Meg	
R38	100KΩ	½	230104-86	BTS-100K	
R39	470KΩ	½	230104-94	BTS-470K	
R40	1000Ω	½	230104-62	BTS-1000	
R41	3300Ω	½	230104-68	BTS-3300	
R42	22KΩ	½	230104-78	BTS-22K	
R43	470KΩ	½	230104-94	BTS-470K	
R44	5600Ω	½	230104-71	BTS-5600	
R45	470KΩ	½	230104-94	BTS-470K	
R46	470KΩ	½	230104-94	BTS-470K	
R47	47KΩ	½	230104-82	BTS-47K	
R48	220Ω	2	230106-54	BTB-220	
R49	100KΩ	½	230104-86	BTS-100K	
R50	8200Ω	½		BTS-8200	
R51	125Ω	10	240021-11	1 3/4A-125	
R52	750Ω	10	240021-46	1 3/4A-750	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓐ .71A	550VCT ⓐ 104A	5V ⓐ 2A	6.3V ⓐ 3.2A	30008I-1				26R36 ①	

① Use universal mounting brackets.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	10.4KΩ	3Ω to 4Ω	330037-3	Z1404 ①	A2936	A3823	26S46	S-53X	① Use 4Ω secondary tap.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Trans.	0ΩCT	0Ω	360491-2				
L2	FM Ant. Coil	0Ω		360629-1				
L3	RF Coil	.1Ω		360522-9	19-1002		4606	2 Microhenries
L4	FM RF Coil	0Ω		360629-1				
L5	Fil. Choke	.1Ω		360522-9	19-1002		4606	2 Microhenries
L6	Fil. Choke	.1Ω		360522-9	19-1002		4606	2 Microhenries
L7	FM Osc. Coil	0Ω		360628-1				Tapped
L8	AM Ant. Coil	0Ω	.5Ω	460894-1				
L9	AM RF Coil	23Ω	3.7Ω	360348-2			A-5495-RF*	
L10	AM Osc. Coil	5Ω		360407-2	14-1033	BC-387 ■	71-Osc. ▲	Tapped ⓑ .4Ω
L11	1st FM IF	.6Ω	.6Ω	360626-1	16-3487	FM-254	1463	
L12	1st AM IF	15Ω	15Ω	360611-1	16-6758	BC-352	12-C1	
L13	2nd FM IF	.6Ω	.6Ω	360626-1	16-3487	FM-254	1463	
L14	2nd AM IF	26Ω	26Ω	360625-1	16-6770	BC-355	12-C6	
L15	Ratio Det.	4.4Ω	1.5ΩCT	360627-1	17-3498	FM-255	1465	Tertiary Winding=.5Ω
L16	10KC Filter	350Ω		360621-1				

* Enlarge mounting hole.
■ Use secondary winding.
▲ Use primary winding.

CRYSTAL DIODES

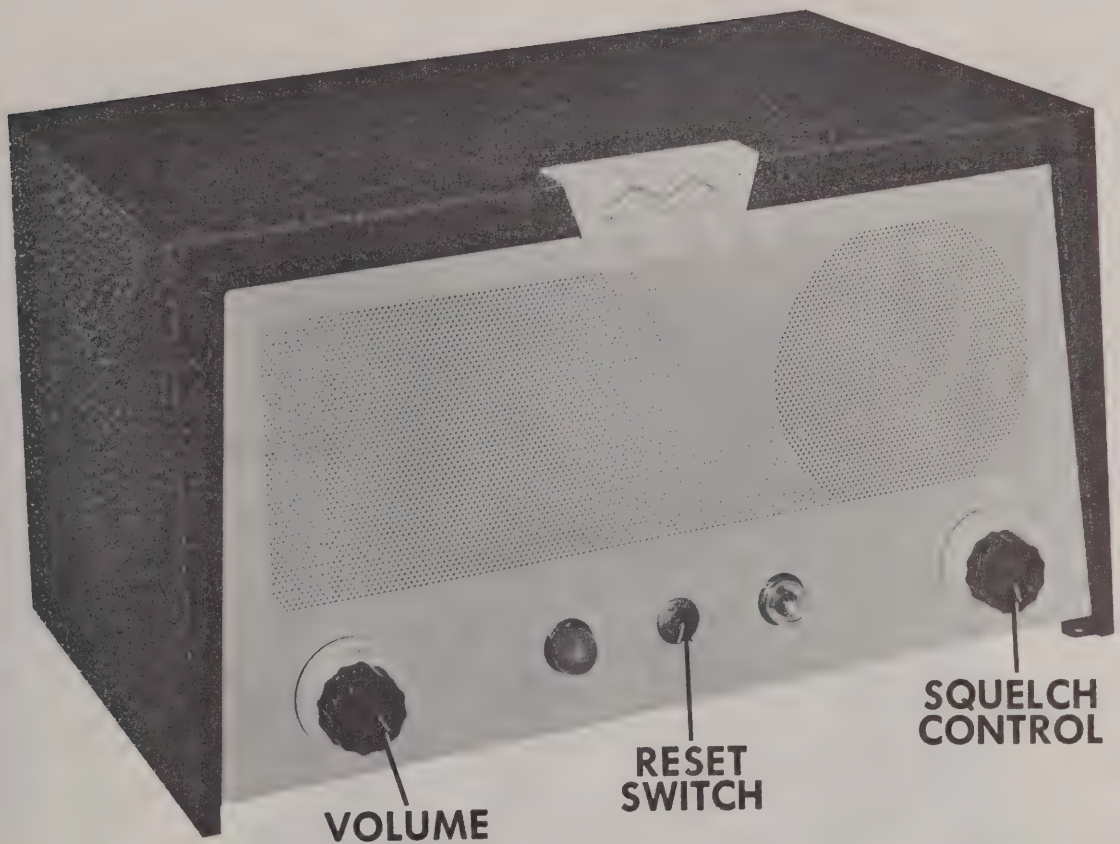
ITEM No.	ORIG. TYPE	REPLACEMENT DATA MAGNAVOX PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M1	1N34A	530030-2	1N54A, 1N58A, 1N38A, 1N55A	AM Audio Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M2	Dial Light	180161-6	#44
M3	Dial Light	180161-6	#44
M4	Pilot Light	180161-6	#44
M5	Tuning Cap.	260133-1	6 Gang (AM Sections: 19-535MMF, 19-535MMF, 15-185MMF)
M6	Switch	160255-1	Band Switch (Rotary-Wafer Type)
	Dial Glass	150420-1	
	Dial Pointer	102448-2	

MONITORADIO
MODEL MCA-100-L

MONITORADIO
MODEL MCA-100-L



MONITORADIO
MODEL MCA-100-L

DENVER, COLORADO

TRADE NAME	Monitoradio Model MCA-100-L
MANUFACTURER	Radio Apparatus Corp., 7900 Pendleton Pike, Indianapolis, Ind.
TYPE SET	AC Operated FM Superheterodyne Receiver
TUBES	Twelve
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .55 Amp. @ 117 Volts
TUNING RANGE-FREQ. MOD.	30MC-50MC

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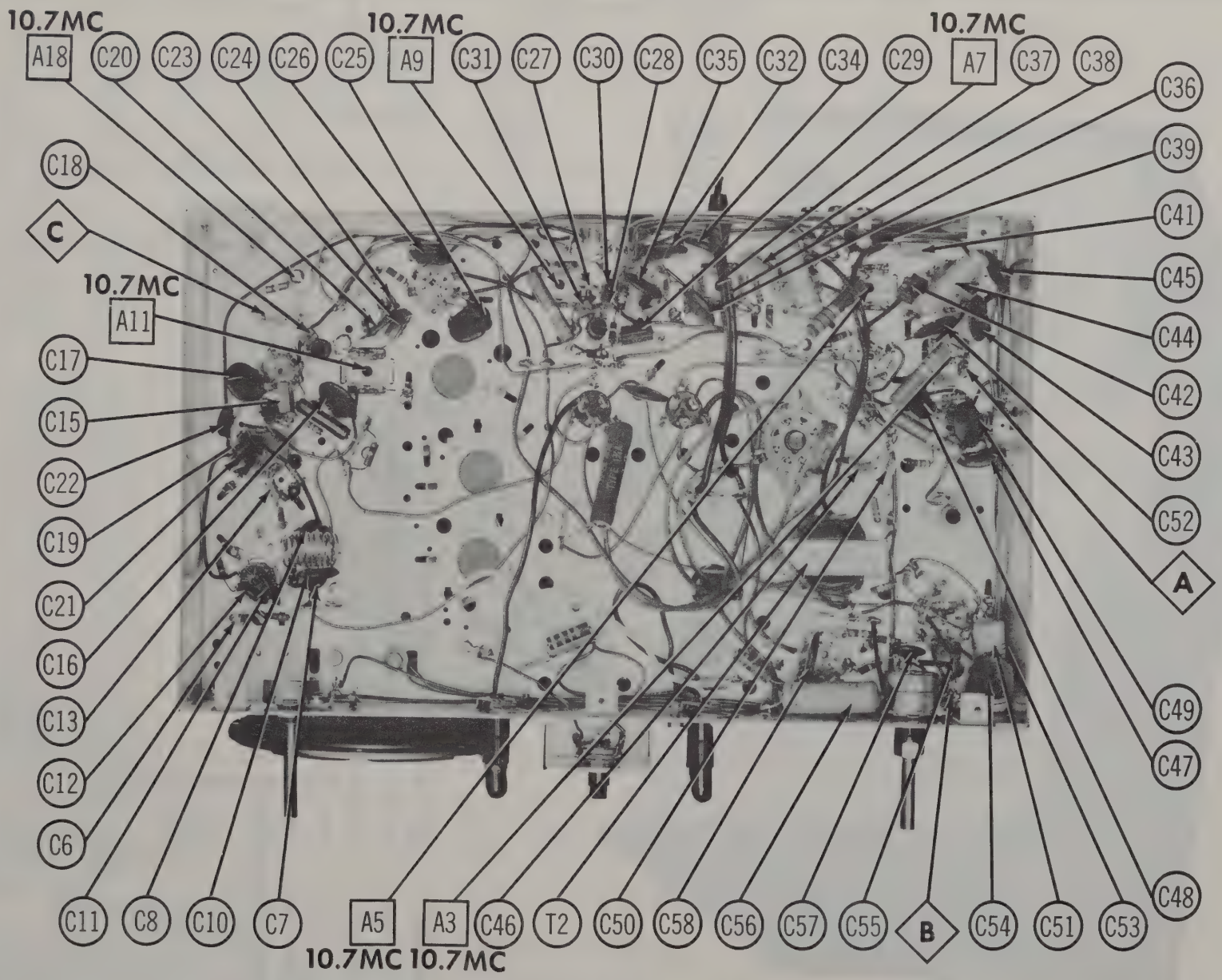
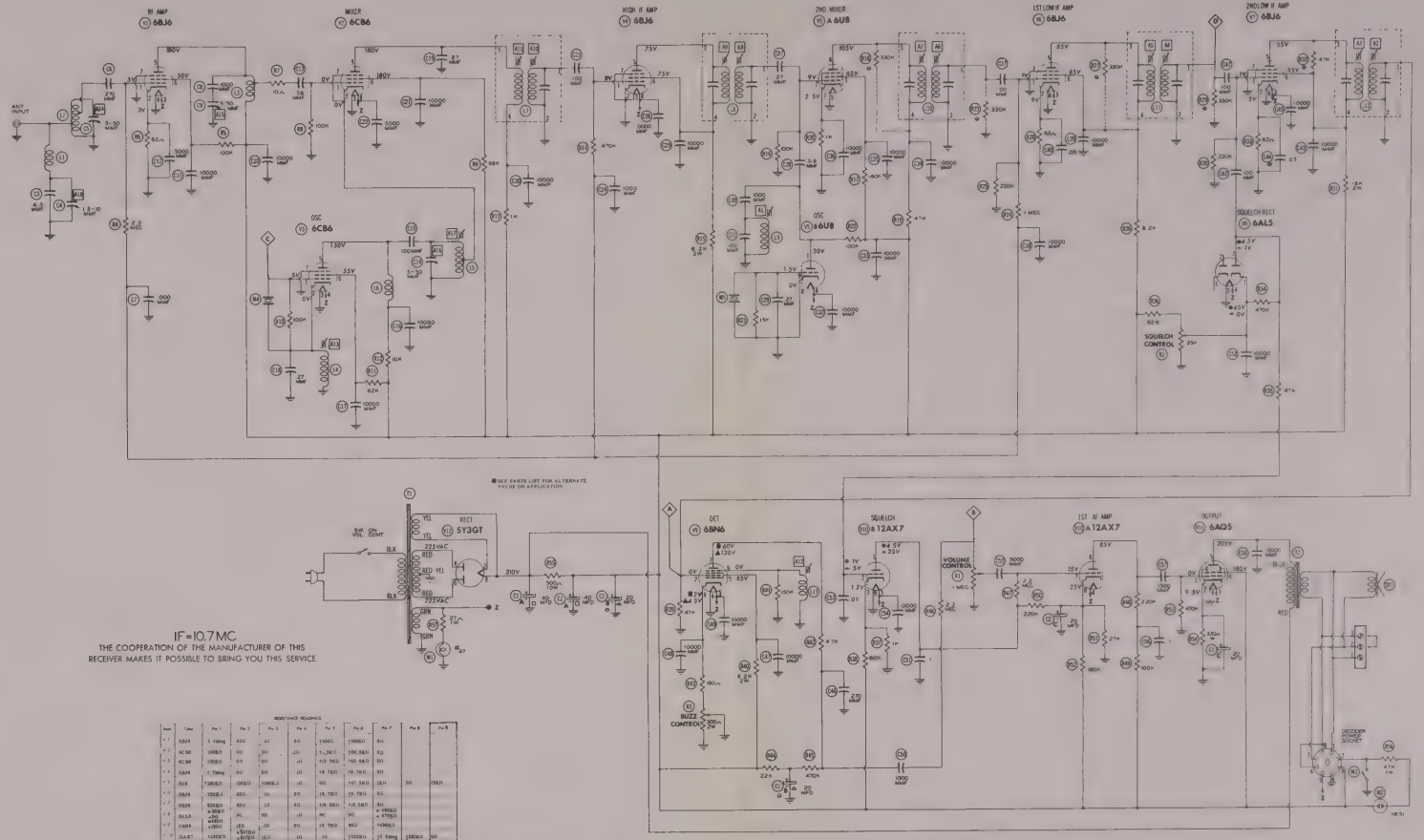


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



IF=10.7MC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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311-11

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CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MONITORADIO
MODEL MCA-100-L

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Do not align unless it is definitely known that IF Alignment has been tampered with.
Proper crystal must be used.
Set output of generator no higher than necessary to obtain readable signal.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

SECOND OSCILLATOR ADJUSTMENT USING VTVM

DC probe to pin 9 of 6U8 (V5). Common to chassis. Adjust L12 slug (A1) for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect synchronized sweep voltage from generator to horizontal input of scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V2). Low side to chassis.	10.7MC (80KC Swp)	Vert. Amp. thru detector (Fig.1) to point Ⓐ. Low side to chassis.	A2, A3, A4, A5, A6, A7	Set marker to 10.7MC and adjust for maximum amplitude and symmetry similar to Fig. 2. When adjusting secondary coil, shunt primary coil with 1KΩ resistor, when adjusting primary coil, shunt secondary coil with 1KΩ resistor. Attenuate generator to prevent distortion of response curve.
2.	"	"	"	"	A8, A9, A10, A11	DO NOT USE SHUNT. Adjust for maximum amplitude and symmetry similar to Fig. 2.
3.	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A12	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 3.

FM RF ALIGNMENT

Insert proper crystal in crystal socket nearest to antenna terminal.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT VTVM	ADJUST	REMARKS
4.				DC probe thru 500KΩ to point Ⓒ. Common to chassis.	A13	Adjust so slug is fully counter clockwise. Readjust slug clockwise for maximum deflection and back-off one-half turn.
5.	22Ω Carbon Resistor	Across antenna terminals with 22Ω in high side (use short leads)	Freq. of signal desired (unmod)	DC probe thru 500KΩ to point Ⓓ. Common to chassis.	A14, A15, A16, A17	A16 and A17 are critical adjustments. Set A17 fully counter clockwise. Set A16 for MINIMUM capacity. (coincide solder spots). Adjust A14, A15, A16 and A17 in order given for maximum deflection. CAUTION: Do not pass thru peak deflection to low freq. side. Correct adjustment of A16 and A17 is obtained when they are tuned to twice the crystal freq. (10.7MC above signal freq.). Self-oscillation in mixer stage is result of adjustment error.
6.	"	"	"	"	A14, 15	Readjust for maximum deflection.
7.	"	"	Image Freq. (Unmod) 21.4MC above desired freq.	"	A18	Adjust for MINIMUM deflection.
8.	"	"	Freq. of signal desired (Unmod)	"	A14	Readjust for maximum deflection. Repeat step 7 and 8 for further improvement.

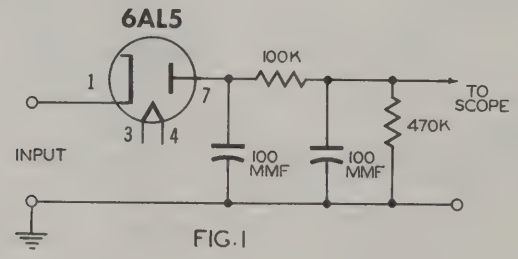

FIG. 1

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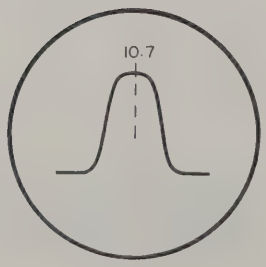


FIG. 2

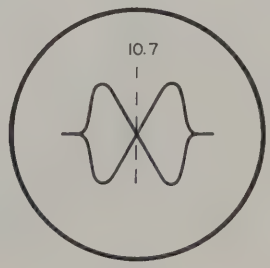


FIG. 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		Monitoradio PART No.	STANDARD REPLACEMENT	
V1	RF Amplifier	6BJ6	6BJ6	
V2	Mixer	6CB6	6CB6	
V3	Oscillator	6CB6	6CB6	
V4	HI IF Amplifier	6BJ6	6BJ6	
V5	2nd. Mixer - Oscillator	6U8	6U8	
V6	1st. Low IF Amp.	6BJ6	6BJ6	
V7	2nd. Low IF Amp.	6BJ6	6BJ6	
V8	Squelch Rectifier	6AL5	6AL5	
V9	FM Detector	6BN6	6BN6	
V10	1st. AF Amplifier-Squelch	12AX7	12AX7	
V11	Output	6AQ5	6AQ5	
V12	Rectifier	5Y3GT	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Monitoradio PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	250		AFH3-20	C016	FP321	TM-402020-250	T-090	TVL-3540
B	▲20	250	(Note 1)						
C	20	25							
C2A	■40	250		AFH3-20	C016	FP321	TM-402020-250	T-090	TVL-3540
B	▲20	250	(Note 1)						
C	20	25							

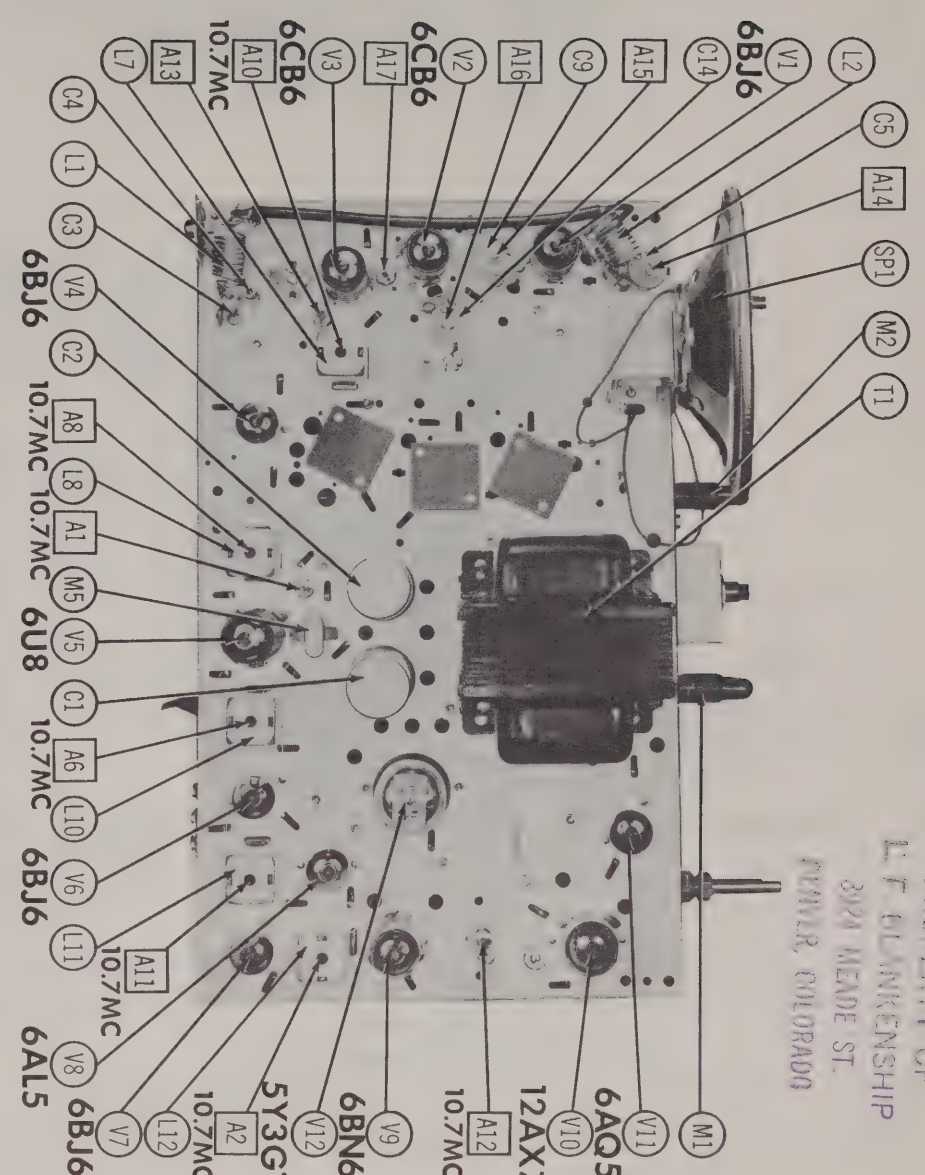
Note 1. Some versions may use a 40MFD unit in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Monitoradio PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	4.3									
C4	1.5-10				829-10					
C5	.5-50									
C6	270		35-006-271	SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C7	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C8	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C9	5-50									
C10	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C11	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C12	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C13	56			SI56	D6-560	TP31	GP1K-560	UC-5456	5GA-Q56	
C14	5-50									
C15	100	500	35-006-101	NP0-SI100	TCZ-100	5R5T1	NP0-337-101	MCE235	MS-31	
C16	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C17	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C18	27	500	35-006-270	1469-000027	TCZ-27	5R5Q27	NP0L-270		MS-427	
C19	27	500	35-006-270	1469-000027	TCZ-27	5R5Q27	NP0L-270		MS-427	
C20	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C21	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C22	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C23	100	500	35-006-101	NP0-SI100	TCZ-100	5R5T1	NP0-337-101	MCE235	MS-31	
C24	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C25	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C26	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C27	27		100-203-3		TCN-27	N027	N750K-270			
C28	3.9									
C29	27	500	35-006-270	1469-000027	TCZ-27	5R5Q27	NP0L-270		MS-427	
C30	1000			BPD-001	DD-102	K069	811-001	DC-521	5HK-D1	
C31	100	500	35-006-101	NP0-SI100	TCZ-100	5R5T1	NP0-337-101	MCE235	MS-31	
C32	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C33	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C34	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C35	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C36	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C37	100	500	35-006-101	NP0-SI100	TCZ-100	5R5T1	NP0-337-101	MCE235	MS-31	
C38	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C39	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

CHASSIS—TOP VIEW



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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	Monitoradio PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C40	.05	200	35-001-503	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C41	100	500	35-006-101	NP0-S1100	TCZ-100	5R5T1	NP0-337-101	MCE235	MS-31	
C42	100	500	35-006-101	NP0-S1100	TCZ-100	5R5T1	NP0-337-101	MCE235	MS-31	
C43	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C44	.05	200	35-001-503	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	Note 2
C45	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C46	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C47	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C48	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C49	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C50	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C51	.1	400	35-002-104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C52	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C53	.05	200	35-001-503	BPD-05	DF-503	CUB2S5		PT4147	2TM-S5	
C54	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C55	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C56	.1	400	35-002-104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C57	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C58	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

Note 2. Some versions may use a .01MFD unit in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Monitoradio PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	300-268-1	B-70-S	A47-1Meg-Z	Q13-137	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A
R2A	25KΩ	½	300-268-2	B-27	A47-25K-V	Q14-120	U-28	Squelch
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3	300Ω	2	100-456		39-300			Buzz - Wire wound

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	Monitoradio PART No.	IRC PART No.	NOTES
R4	2.2Meg	¼	35-011-225	BTS-2.2Meg	
R5	100KΩ	¼	35-011-104	BTS-100K	
R6	82Ω	¼	35-008-820	BTS-82	
R7	10Ω	¼	35-011-100	BTS-10	
R8	100KΩ	¼	35-011-104	BTS-100K	
R9	68KΩ	¼	35-011-683	BTS-68K	
R10	100KΩ	¼	35-011-104	BTS-100K	
R11	82KΩ	¼	35-008-823	BTS-82K	
R12	10KΩ	¼	35-011-103	BTS-10K	
R13	1000Ω 5%	¼	35-011-102	BTS-1000 5%	
R14	470KΩ	¼	35-011-474	BTS-470K	
R15	8200Ω	2	35-010-822	BTB-8200	
R16	100KΩ	¼	35-011-104	BTS-100K	
R17	180KΩ	¼	35-008-184	BTS-180K	
R18	330KΩ	¼	35-008-334	BTS-330K	Note 1
R19	47KΩ	¼	35-008-473	BTS-47K	
R20	1000Ω 5%	¼	35-011-102	BTS-1000 5%	
R21	15KΩ	¼	35-008-153	BTS-15K	
R22	100KΩ	¼	35-011-104	BTS-100K	
R23	330KΩ	¼	35-008-334	BTS-330K	Note 1
R24	1Meg	¼	35-011-105	BTS-1Meg	
R25	220KΩ	¼	35-011-224	BTS-220K	
R26	8200Ω	¼	35-010-822	BTB-8200	
R27	330KΩ	¼	35-008-334	BTS-330K	Note 1
R28	82Ω	¼	35-008-820	BTS-82	
R29	330KΩ	¼	35-008-334	BTS-330K	Note 1
R30	220KΩ	¼	35-011-224	BTS-220K	
R31	18KΩ	2	35-010-183	BTB-18K	
R32	47KΩ	¼	35-008-473	BTS-47K	Note 1
R33	82Ω	¼	35-008-820	BTS-82	
R34	470KΩ	¼	35-011-474	BTS-470K	
R35	47KΩ	¼	35-008-473	BTS-47K	
R36	82KΩ	¼	35-008-823	BTS-82K	
R37	1000Ω 5%	¼	35-001-102	BTS-1000 5%	
R38	180KΩ	¼	35-008-184	BTS-180K	
R39	47KΩ	½	35-008-473	BTS-47K	
R40	8200Ω	2	35-010-822	BTB-8200	
R41	150KΩ	¼	35-011-154	BTS-150K	
R42	4700Ω	¼	35-011-472	BTS-4700	
R43	180Ω	¼	35-008-181	BTS-180	
R44	22KΩ	¼	35-011-223	BTS-22K	
R45	470KΩ	¼	35-011-474	BTS-470K	
R46	2.2Meg	¼	35-011-225	BTS-2.2Meg	
R47	2.2Meg	¼	35-011-225	BTS-2.2Meg	
R48	220KΩ	¼	35-011-224	BTS-220K	
R49	100KΩ	¼	35-011-104	BTS-100K	
R50	220KΩ	¼	35-011-224	BTS-220K	
R51	27KΩ	¼	35-008-273	BTS-27K	
R52	180KΩ	¼	35-008-184	BTS-180K	
R53	470KΩ	½	35-011-474	BTS-470K	
R54	330Ω	1	35-009-331	BTA-330	
R55	500Ω	10	35-014-1	1 3/4A-500	
R56	47KΩ	1	35-009-473	BTA-47K	
R57	27Ω	1	35-009-270	BTA-27	

Note 1. In some versions, these resistors may have different values or may be omitted.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	Monitoradio PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .55A	440VCT .114ADC	5VAC @ 2A	6.3VAC @ 3.64A	500-186-1					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Monitoradio PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5.2KΩ	3.9Ω	300-310-1	Z1001	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	Monitoradio PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	5"	PM	3.9Ω	750B12	5A1 ①	228S1	① Use Universal Mounting Bracket.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	Monitoradio PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap Coil	0Ω		350-008-4				
L2	FM Ant. Coil	0Ω		350-008-2				Tapped
L3	FM RF Coil	0Ω		350-008-1				Tapped
L4	Crystal Osc. Coil	0Ω		300-096-1				Tapped
L5	FM Osc. Coil	0Ω		300-307-1				
L6	RF Choke	.7Ω		300-303-1	19-1005		4612	9.8 Microhenries
L7	1st. FM IF	.6Ω	.6Ω	300-077-1	16-3487	FM-254	1463	
L8	2nd. FM IF	.6Ω	.6Ω	300-077-2	16-3487	FM-254	1463	
L9	2nd. Osc. Plate Coil	0Ω		300-307-2				
L10	3rd. IF Trans.	25Ω	25Ω	300-322-3	16-6758	BC-352	12-C1	
L11	4th. IF Trans.	27Ω	27Ω	300-322-3	16-6758	BC-352	12-C1	
L12	5th. IF Trans.	14Ω	14Ω	300-322-2	16-6758	BC-353	12-C2	
L13	Quadrature Coil	87Ω		350-000				

MISCELLANEOUS

ITEM No.	PART NAME	Monitoradio PART No.	NOTES
M1	Pilot Light		#47
M2	Neon Light		Type NE51 (Used in selective calling system)
M3	Switch		Pushbutton (Used in selective calling system)
M4	Crystal	300-305	RF Osc. (Specify Frequency)
M5	Crystal	300-304	IF Osc. - 10.245MC
	Knob	500-195-1	On-off-volume
	Knob	500-195-2	Squelch

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DENVER, COLORADO

PHILCO MODELS D-655
(Codes 121, 123), D-661 (Code 121)

PHILCO MODELS D-655
(Codes 121, 123), D-661 (Code 121)

TRADE NAME	Philco Models D-655 (Code 121, 123), D-661 (Code 121)
MANUFACTURER	Philco Corp. Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amp., 1S5 (or) 1U5 Det. -AVC-AF Amp., 3V4 Output
POWER SUPPLY RATING	110-120 Volts AC-DC (or) 1.5 Volts "A" Supply & 75 Volts "B" Supply .14 Amp. @ 117 Volts AC (or) 250MA @ 1.5 Volts DC & 9MA@ 75 Volts DC
TUNING RANGE—BROADCAST	535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2, A3	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop (Radiated)	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	
4.		"	600KC	Tune to 600KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		PHILCO PART No.	STANDARD REPLACEMENT	
V1	Converter	1R5	1R5	
V2	IF Amp.	1U4	1U4	
V3	Det. -AVC-AF Amp.	1S5	1S5	1U5 may be used in this application.
V4	Output	3V4	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 50	150	30-2568-39				TM-D50-150	D-065	
B	▲ 40	150					TD-10-150	FM-1512	
C	10	150							
C2	50	25	45-3035-2	PRS25V50	BR502	TC29	TD-50-25	FM-0250	TVA-1206

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	1.5		30-1221-3	NPO-S11.5	TCZ-1R5	TZ04	NPOA-1R5	ZT-5515	5TCCB-V15	Note 1
C4	7.5		30-1224-83							
C5	47		62-047009001	NPO-S147	TCZ-47	TZ22	NPO-338-470	ZT-5447	5TCC-Q47	
C6A	4000		30-1239	BPD-2X004	D6-402	DKO78	822-004		5HK-2D4	
B	4000				D6-402					
C7	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C8	3.3		30-1221	NPO-S13.3	TCZ-3R3	TZ06	NPOA-3R3	ZT-5533	5TCCB-V33	
C9A	1000									
B	10000		30-1237							
C	2000									
D	220									
C10	.003	600	30-4560-55	SI3000	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C11	.22	100	30-4656-1	P288N-22		CUB2P22		PT6022	2TM-P22	
C12	.047	400	30-4650-45	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C13	.1	400	30-4650-47	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	

Note 1. Not used in some versions.

CONTROLS

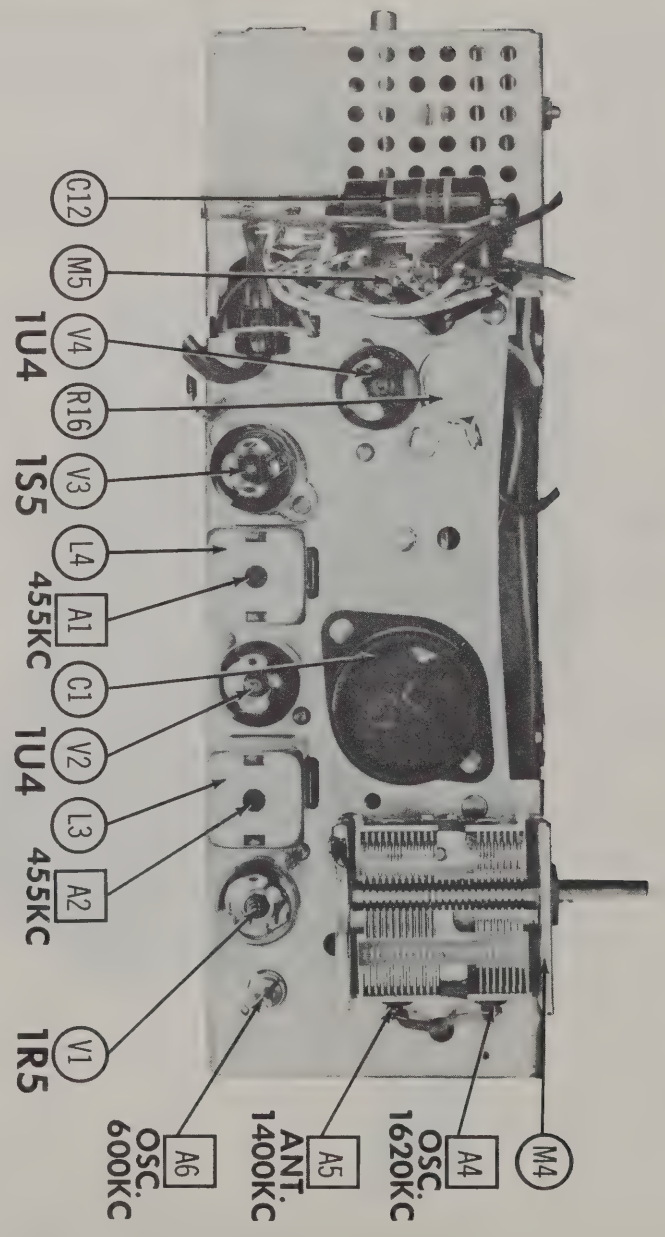
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1Meg	½	33-5566-72					Volume & Switch

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R2	820Ω	½	66-1828340	BTS-820	
R3	470Ω	½	66-1478340	BTS-470	
R4	68KΩ	½	66-3688340	BTS-68K	
R5	15KΩ	½	66-3158340	BTS-15K	
R6	3.3Meg	½	66-5338340	BTS-3.3Meg	
R7	2.2Meg	½	66-5228340	BTS-2.2Meg	
R8	4.7Meg	½	66-5478340	BTS-4.7Meg	
R9	680KΩ	½	66-4688340	BTS-680K	
R10	4.7Meg	½	66-5478340	BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R11	2.2Meg	½	66-5228340	BTS-2.2Meg	
R12	2200Ω	½	66-2228340	BTS-2200	
R13	1500Ω	½	66-2158340	BTS-1500	
R14	470Ω	½	66-1478340	BTS-470	
R15	820Ω	½	66-1828340	BTS-820	
R16A	1050Ω	10	33-3445		
B	1050Ω	10			
R17	120Ω	2	33-1334-19		
R18	150KΩ	½	66-4158340	BTS-150K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	9KΩ	3.4Ω	32-8434		A-2927 ①	A-3329	24S49	S-11X	① Drill new mtg. hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3.4Ω	36-1637	4A07	223S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.8Ω		76-9584				
L2	Osc. Coil	1.6Ω	6.5Ω	32-4453-1	14-1074	BC-387	71-Osc.	
L3	Input IF	25Ω	25Ω	32-4160-4A	16-6758	BC-352	12-C1	
L4	Output IF	35Ω	25Ω	32-4454-1A	16-6770	BC-355	12-C6	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	PHILCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.066ADC	34-8003	1003A	RS075	6S75	5M4	75	

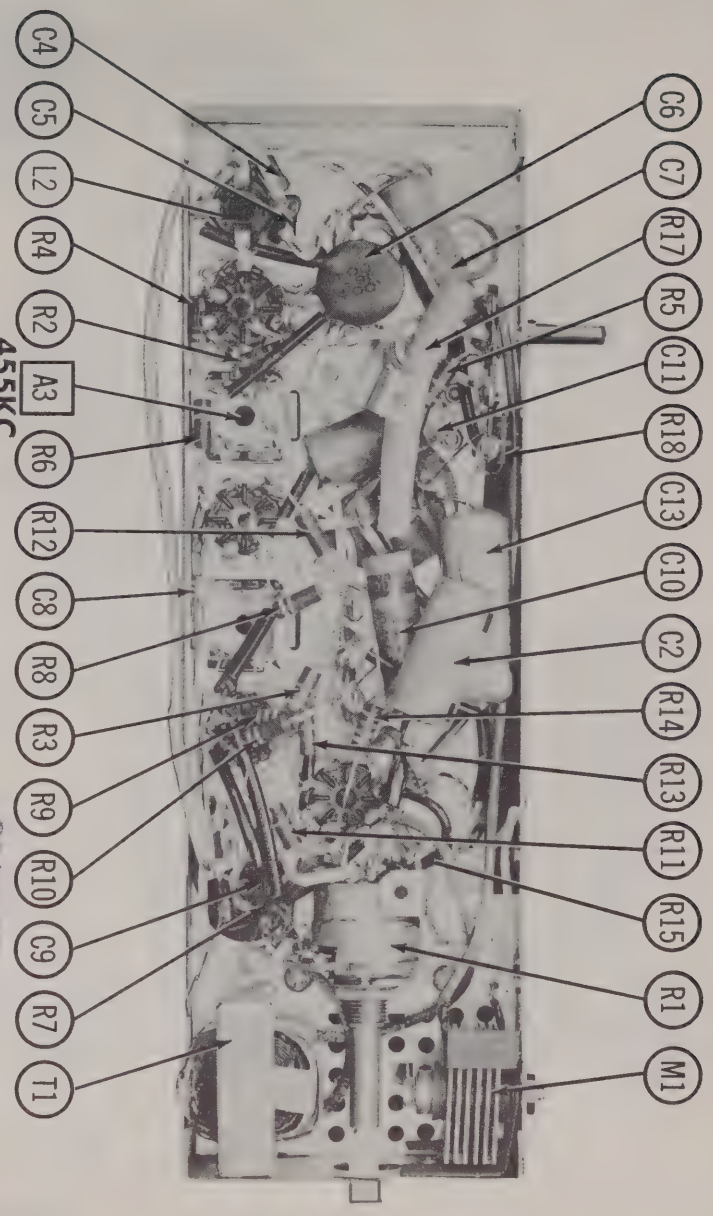
BATTERIES

ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V"A"	P77	964			21R			Connect 2 in parallel
M3	75V"B"	P144		437			XX50		

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Tuning Cap.	31-2735-10	2 Gang (27-335MMF, 15-140MMF)
M5	Switch	42-1925-2	Power Changeover (Rotary-Wafer Type)
	Cabinet	11112	Model 655
	Cabinet	11112-1	RIO Red-Model D-655
	Cabinet	11112-2	Veradera Sand-Model 655
	Cabinet	11064-8	Carribean Green-Model D-661
	Cabinet	11064-9	Navy-Model D-661
	Cabinet	11064-7	Tropical Red-Model D-661
	Handle	54-6205	Model 655
	Handle	54-6205-1	For RIO Red Cabinets-Model 655
	Handle	54-6205-2	For Veradera Sand Cabinets-Model 655
	Handle	54-6012-13	For Carribean Green Cabinets-Model 661
	Handle	54-6012-14	For Navy Cabinets-Model 661
	Handle	54-6012-12	For Tropical Red Cabinets-Model 661
	Knob	54-6147-10	Tuning-Model 655
	Knob	54-6147-19	Tuning-For RIO Red Cabinets-Model 655
	Knob	54-6147-20	Tuning-For Veradera Sand Cabinets-Model 655
	Knob	54-6147-15	Tuning-For Carribean Green Cabinets-Model 661
	Knob	54-6147-16	Tuning-For Navy Cabinets-Model 661
	Knob	54-6147-14	Tuning-For Tropical Red Cabinets-Model 661
	Knob	54-6016-13	On-off-volume-Model 655
	Knob	54-6016-17	On-off-volume-For RIO Red Cabinets-Model 655
	Knob	54-6016-18	On-off-volume-For Veradera Sand Cabinets-Model 655
	Knob	54-6016-15	On-off-volume-For Carribean Green Cabinets-Model 661
	Knob	54-6016-16	On-off-volume-For Navy Cabinets-Model 661
	Knob	54-6016-14	On-off-volume-For Tropical Red Cabinets-Model 661
	Dial Scale	28-10228-2	Model 661

CHASSIS—BOTTOM VIEW



PROPERTY OF
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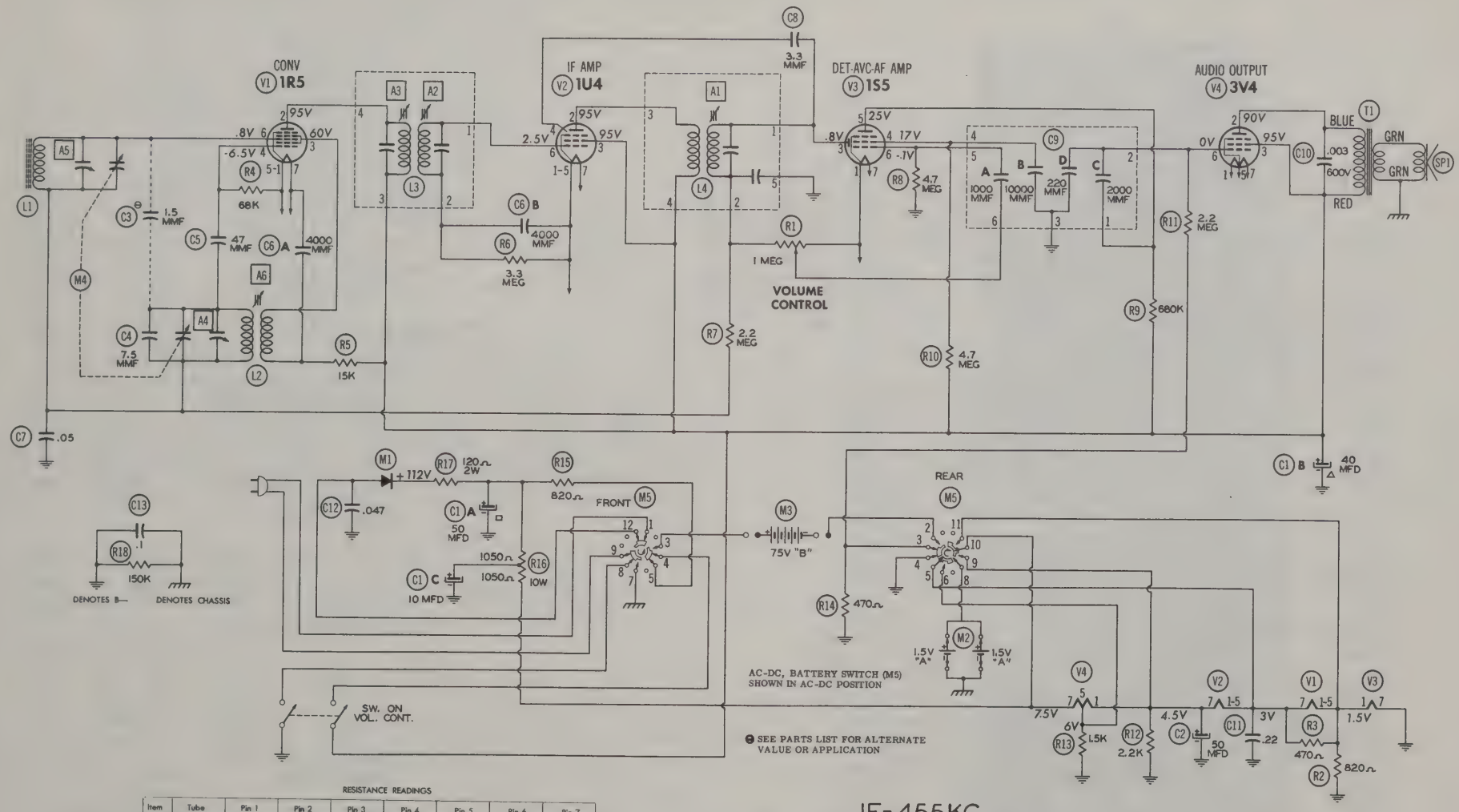
DENVER, COLORADO

PHILCO
Model D-655 (Code 121, 123)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	18Ω	† 965Ω	† 15.9KΩ	68KΩ	18Ω	3.2Meg	34Ω
V 2	1U4	34Ω	† 965Ω	† 940Ω	TP	34Ω	3.3Meg	44Ω
V 3	1S5	18Ω	TP	1Meg	† 4.7Meg	† 1.6KΩ	4.7Meg	0Ω
V 4	3V4	44Ω	† 1.3KΩ	† 940Ω	TP	56Ω	2.2Meg	68Ω

† MEASURED FROM OUTPUT OF M1.
TP-TIE POINT.

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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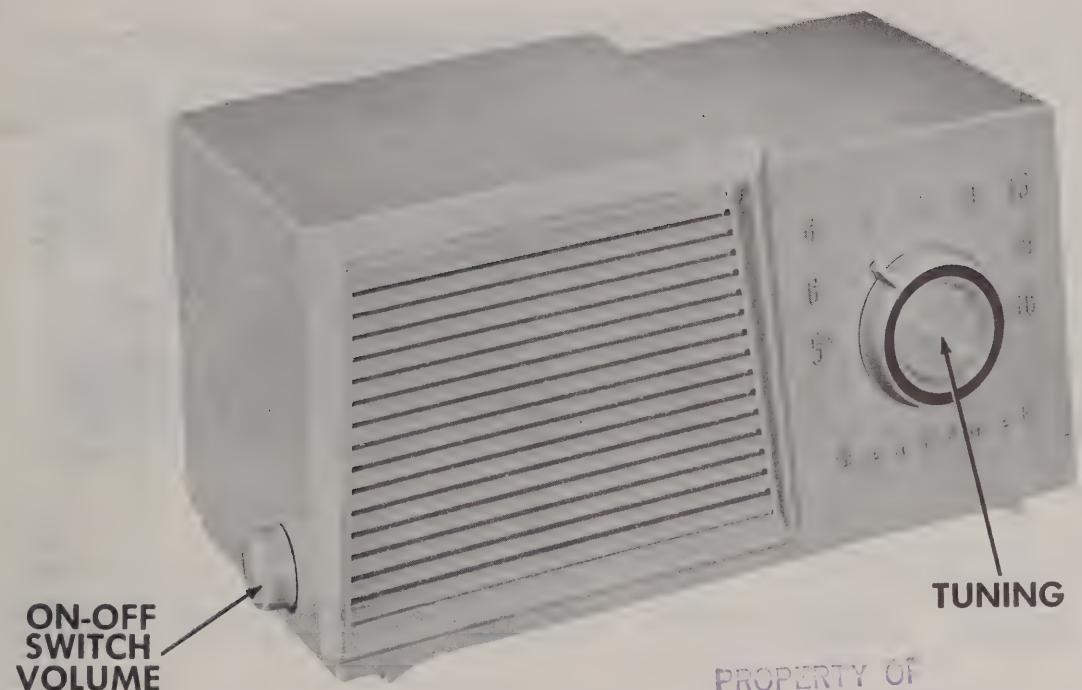
SENTINEL MODELS
1U-352, 1U-352-2, 352



PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

SENTINEL MODELS
1U-352, 1U-352-2, 352

TRADE NAME	Sentinel Models 352, 1U-352, 1U-352-2
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dempster, Evanston, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6, IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to antenna lug on tuning gang. Low side to B-.	455KC	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		SENTINEL PART No.	STANDARD REPLACEMENT	
V1	Converter	12BE6	12BE6	
V2	IF Amplifier	12BA6	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	12AV6	
V4	Output	50C5	50C5	
V5	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SENTINEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	25E24	PRS150V5050	BBRD5515	TCD49	TDL-D50-150	FMD-1550	TVA-2453
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	200		23E4000-29	SI200	D6-201	TP38	GP2K-201	UC-532	5GA-T2	
C3	.047	200	23E3214	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C4	30		† 23E2022-4	SI30	D6-330	GO28	GP1K-300	UC-5433	5GA-Q30	
C5A	220									
B	5000									
C	5000		♦ 23E2041-6	♦ PA-113-2	♦ PC-151	♦ 116TM2	♦ 1408-02		♦ DT-2	
D	250									
E										
C6	10000		23E4004-17	BPD-01	DD-103	KO82	811-01	DC-511	5HK-S1	
C7	.047	400	23E3414	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C8	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	Note 1

Note 1. Some versions may use a series capacitor and coil unit in this application (Part No. 20E833).
† Items C4 and R3 are combined in one unit.
♦ Items C5A, C5B, C5C, C5D, C5E, R7A, R7B and R7C are combined in one unit. When replacing items separately, C5D and C5E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SENTINEL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	28E105	AB-60	A47-500K-Z	Q13-133	U-53	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A.

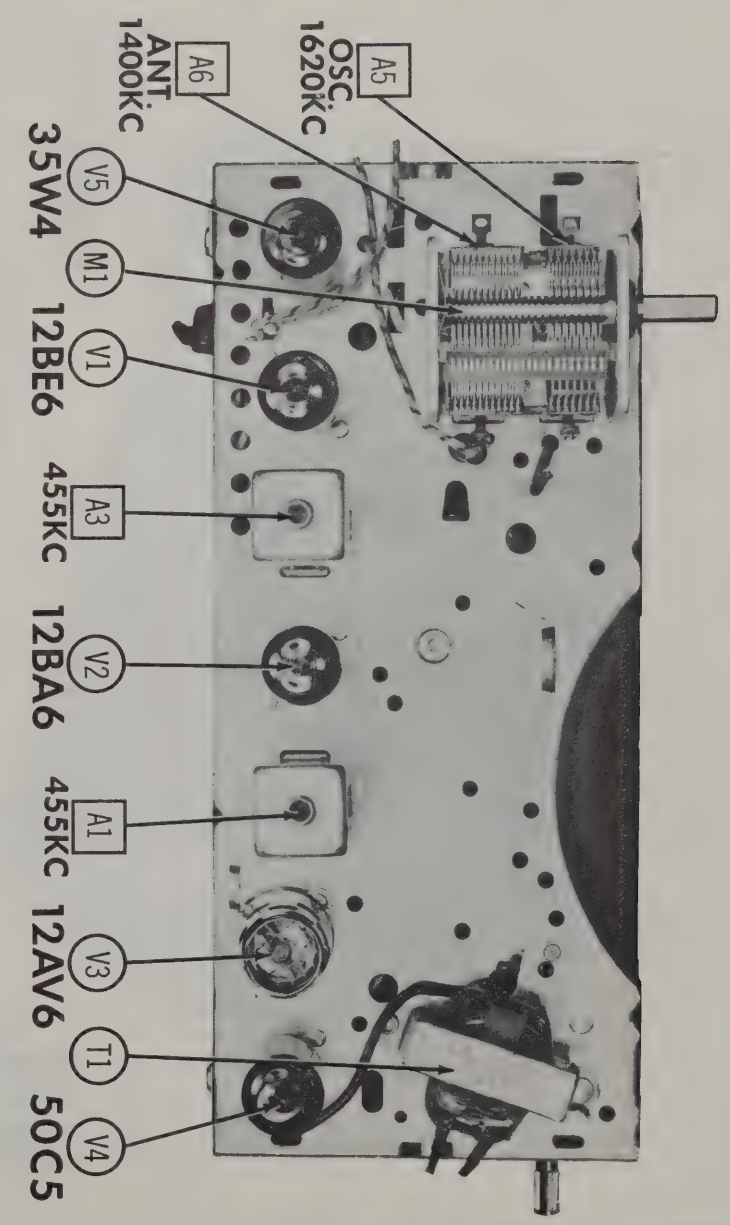
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SENTINEL PART No.	IRC PART No.	
R2	1Meg	½	27E105M-½	BTS-1Meg	
R3	22K		† 23E2022-4	BTS-22K	
R4	3.3Meg		27E335M-½	BTS-3.3Meg	
R5	68Ω		27E680K-½	BTS-68	
R6	47KΩ		27E473K-½	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SENTINEL PART No.	IRC PART No.	
R7A	6.8Meg		♦ 23E2041-6	BTS-6.8Meg	
B	470KΩ			BTS-470K	
C	470KΩ			BTS-470K	
R8	150Ω	½	27E151K-½	BTS-150	
R9	1200Ω	1	27E122K-1	BTA-1200	
R10	33Ω	1	27E330K-1	BTA-33	

† Items R3, C4 are combined in one unit.
♦ Items R7A, R7B, R7C, C5A, C5B, C5C, C5D, C5E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.7K	3Ω	22E88	Z1101	A3025	A3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SENTINEL PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3Ω	1E55	4A07	223S1	

COILS (RF-IF)

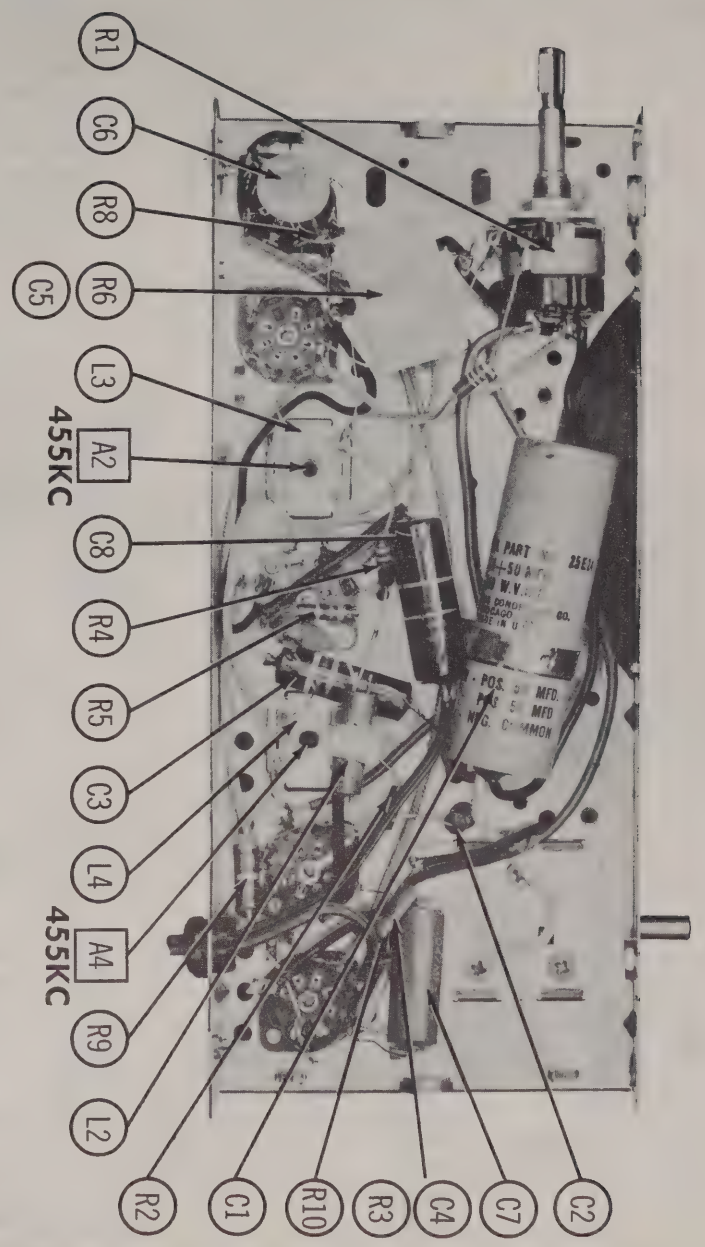
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SENTINEL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.6Ω		20E942				Includes cabinet back
L2	Osc. Coil	1.2Ω	10.2Ω	20E938		BC-394	70-Osc.	
L3	Input IF	13Ω	13Ω	20E732	16-6758	BC-352	12-C1	
L4	Output IF	17Ω	17Ω	20E732	16-6758	BC-353	12-C2	
L5	Chassis Isolation							Not used in some versions

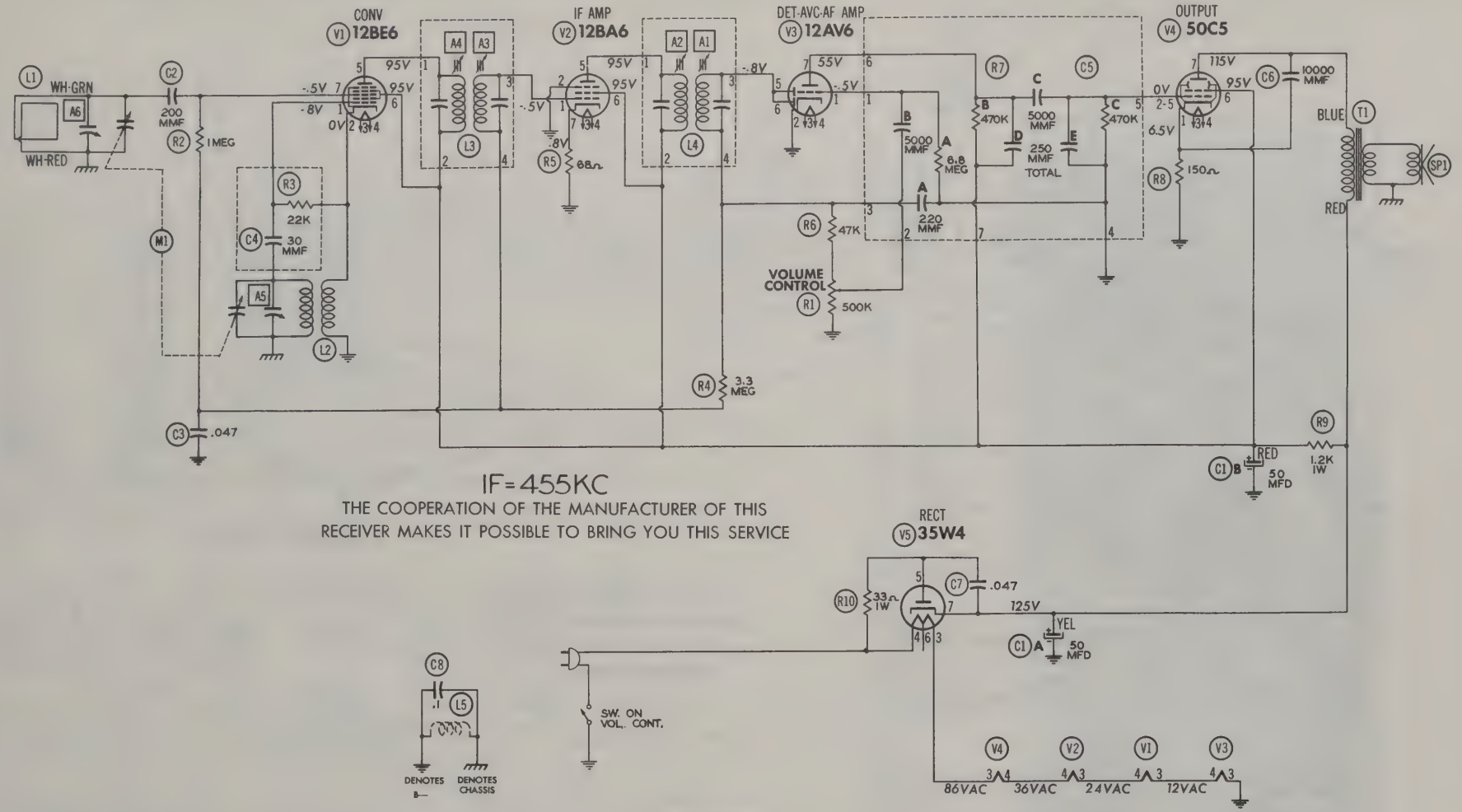
MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M1	Tuning Cap.	24E64	2 Gang (14-315MMF, 12-105MMF)
	Cabinet	7E398	Mahogany
	Cabinet	7E398-2	Ivory
	Cabinet	7E398-3	Red
	Cabinet	7E398-4	Tan
	Cabinet	7E398-5	Green
	Cabinet	7E398-6	Rust
	Knob	35E38	Station Selector-Mahogany
	Knob	35E38-2	Station Selector-Ivory
	Knob	35E38-3	Station Selector-Red
	Knob	35E38-4	Station Selector-Tan
	Knob	35E38-5	Station Selector-Green
	Knob	35E38-6	Station Selector-Rust
	Knob	37E47-12	On-off-volume-Mahogany
	Knob	37E47-13	On-off-volume-Ivory
	Knob	37E47-14	On-off-volume-Red
	Knob	37E47-15	On-off-volume-Tan
	Knob	37E47-16	On-off-volume-Green
	Knob	37E47-17	On-off-volume-Rust

L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS—BOTTOM VIEW





IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1Ω	12Ω	24Ω	† 1.2KΩ	† 1.2KΩ	4.8Meg
V 2	12BA6	3.8Meg	0Ω	24Ω	36Ω	† 1.2KΩ	† 1.2KΩ	68Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	547KΩ	547KΩ	† 471KΩ
V 4	50C5	150Ω	470KΩ	86Ω	36Ω	470KΩ	† 1.2KΩ	† 220Ω
V 5	35W4	NC	TP	86Ω	121Ω	154Ω	115Ω	70KΩ

† MEASURED FROM PIN 7 OF V5.
NC-NO CONNECTION.
TP-TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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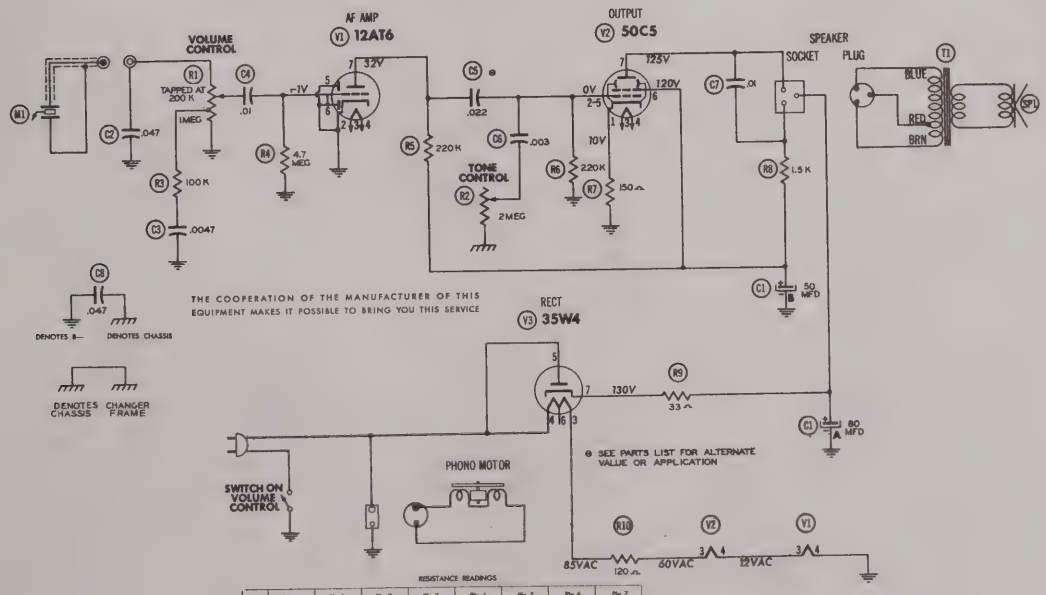
SILVERTONE MODELS
3248, 4248 (Ch. 488.986)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Silvertone Models 3248, 4248 (Ch. 488.986)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier with 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .23 Amp. @ 117 Volts AC

RECORD CHANGER UNIT-SILVERTONE MODEL 488.219



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AT6	4.7MEG	0Ω	15Ω	0Ω	0Ω	0Ω	↑ 200KΩ
V 2	50C5	190Ω	230KΩ	63Ω	13Ω	230KΩ	↑ 1.2KΩ	↑ 310Ω
V 3	35W4	INF	INF	180Ω	300Ω	300Ω	180Ω	68KΩ

† MEASURED FROM PIN #7 OF V2.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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311-14

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	AF Amp.	12AT6	12AT6	
V2	Output	50C5	50C5	
V3	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	K12025	AFH2-19	BO18	FP216	TDL-8050-150	FMT-1540	TVL-3440
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	400	K12009	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C3	.0047	400	K12027	BPD-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C4	.01	400	K12003	BPD-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C5	.022	400		BPD-02	DD-203	CUB4S22	817-02	PT4122	4TM-S22	Note 1
C6	.003	600	K12004	SI3000	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C7	.01	400	K12003	BPD-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C8	.047	400	K12009	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

Note 1. Some versions use .27MFD in this application (Part No. K12026).

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	11964	ABT-72	A47F-1Meg	Q13-137X	UT-440	Volume tapped at 200KΩ
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A.
R2A	2Meg	½	11959	AB-75	A47-2Meg-S	Q11-139	U-56	Tone
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	100KΩ	½	K11213	BTS-100K	
R4	4.7Meg	½	K11613	BTS-4.7Meg	
R5	220KΩ	½		BTS-220K	
R6	220KΩ	½		BTS-220K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R7	150Ω	½	K10533	BTS-150	
R8	1500Ω	½	K10773	BTS-1500	
R9	33Ω	1	K10374		
R10	120Ω	5	K11961		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.3KΩ	3.5Ω	Part of spkr.	Z1103 ①	A-3031 ①	A-3336 ①	24S50A ①		① Drill one new mtg. hole.

SPEAKER

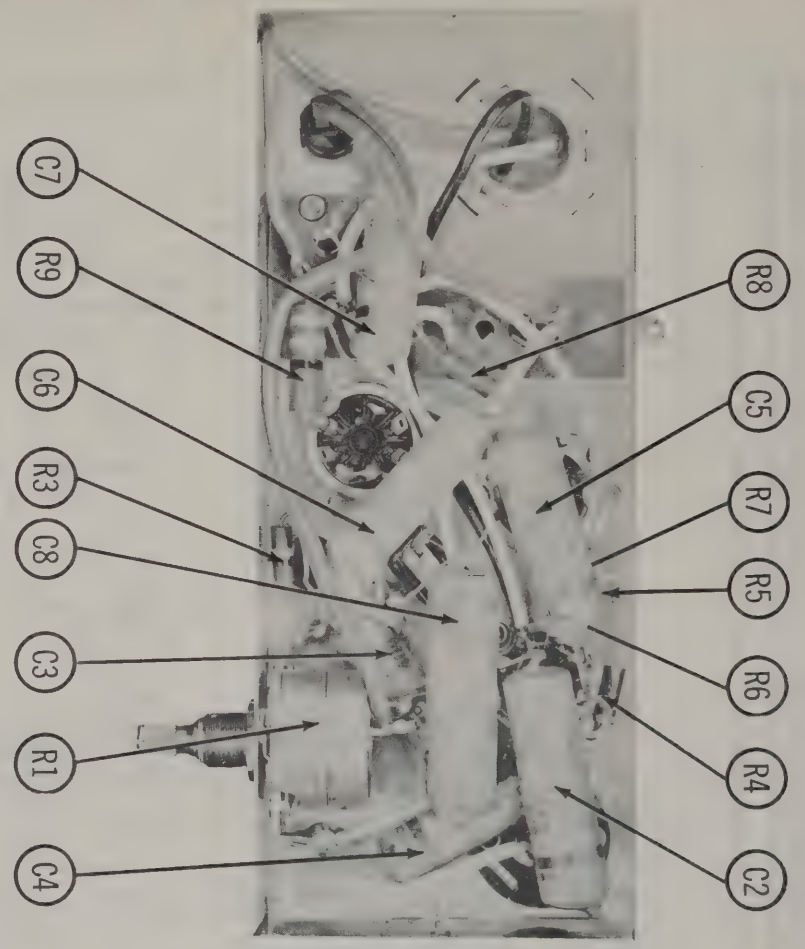
ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"x 6"	PM	3.5Ω	6484-1	46A07	246S2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1	3797	GC-AG-J	G-AG	47	O-2 or S-2	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2	3798	* S-652 or † S-642	* B-326 or † B-334 or ♦ B-334D	* W-3AGA or † W-3AGS	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
	Cabinet	7154	Model 3248
	Cabinet	7580	Model 4248
	Knob	5846	2 used-Model 3248
	Knob	7584	2 used-Model 4248

PHOTOFACT* Folder

*TRADE MARK

SPARTON MODELS 21CL12, U, 21CL13, U, 21CM11, U, 21CM12U, 21CM13, U, 21TL10, U, 21TM10, U (Ch. 15V215, P, T, 16U215, P, T)

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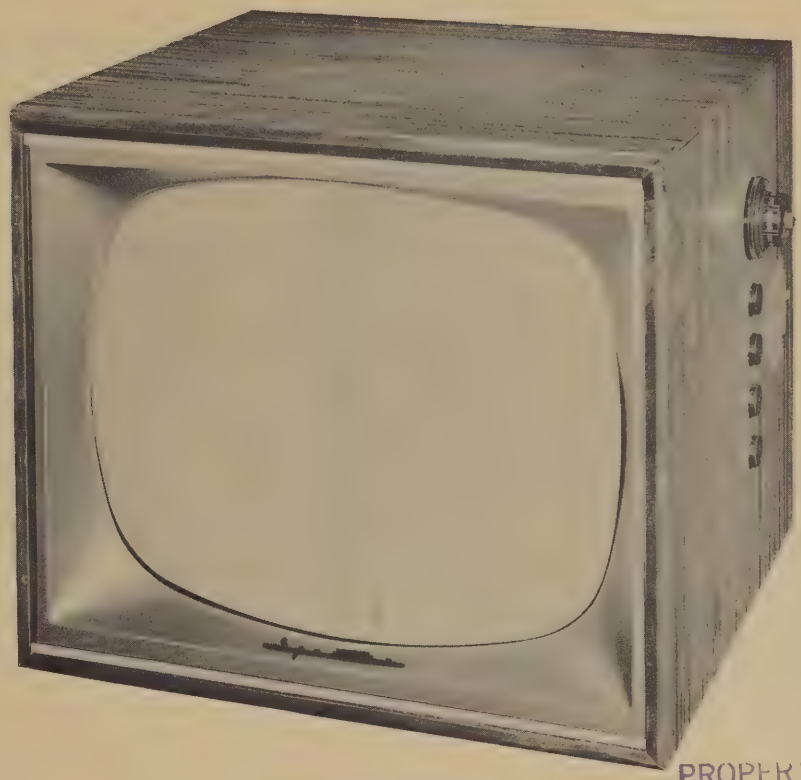

SPARTON MODEL 21TM10U (Ch. 16U215)

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L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Sparton	MODELS	CHASSIS
		21CL12, 21CL13, 21CM11, 21CM12, 21CM13, 21TL10, 21TM10	15V215, P, T
		21CL12U, 21CL13U, 21CM11U, 21CM12U, 21CM13U, 21TL10U, 21TM10U	16U215, P, T
MANUFACTURER	Sparton, Div. of Sparks-Withington Co., Jackson, Michigan		
TYPE SET	Television		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.3 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

INDEX

Alignment Instructions 6

Disassembly Instructions 1

Horizontal Sweep Circuit Adjustments 18

Parts List and Descriptions ..... 11 thru 14

Photographs
- Cabinet-Rear View 18
- Capacitor Identification 3, 10
- Chassis-Top View 7
- RF Tuner 14, 15, 17, 18
- Resistor Identification 4, 9
- Trans., Inductor & Alignment Identification 7

Resistance Measurements 8

Servicing in the Field 1

Schematic (Alternate Tuner) 16

Schematic (TV) 2

Tube Failure Check Chart 5

Tube Placement Chart (Bottom View) 8

Tube Placement Chart (Top View) 5

SPARTON MODELS 21CL12, U, 21CL13, U, 21CM11, U, 21CM12U, 21CM13, U, 21TL10, U, 21TM10, U (Ch. 15V215, P, T, 16U215, P, T)

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*TRADE MARK

SPARTON MODELS 21CL12, U, 21CL13, U, 21CM11, U, 21CM12U, 21CM13, U, 21TL10, U, 21TM10, U (Ch. 15V215, P, T, 16U215, P, T)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from side panel of cabinet.

2. Remove 8 wood screws and 1 metal screw. Remove rear cover.

3. Remove 2 wood screws holding antenna terminal bracket.

4. Remove 2 wood screws holding interlock bracket.

5. Remove pilot light assembly, picture tube socket, ion trap, 3 yoke retaining springs, centering magnet and HV lead.

6. Disconnect speaker leads.

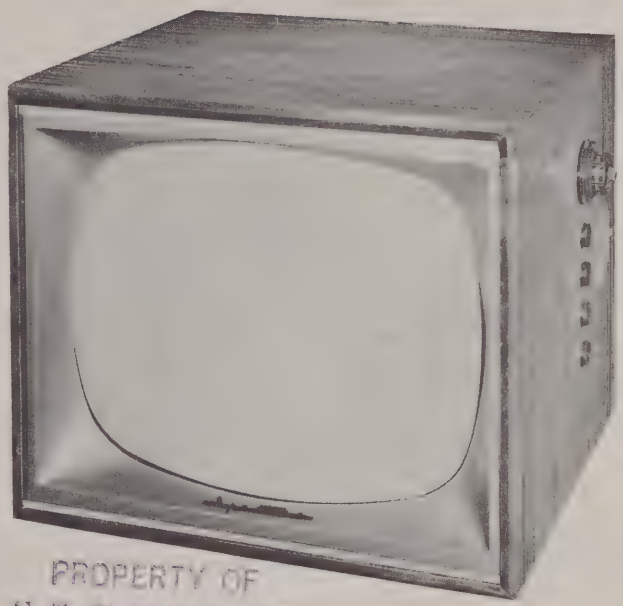
7. Remove 2 bolts from bottom of cabinet holding chassis.

8. Remove 3 wood screws holding chassis braces (2 at the top and one at the side).

9. Remove yoke from picture tube.

10. Disconnect ground wire from tuner of picture tube retainer.

11. Remove chassis.



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SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator adjustments, it is necessary to remove the chassis from the cabinet. (See disassembly instructions).

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 2 wood screws accessible thru holes in cabinet below bottom safety glass mounting rail. Remove mounting rail and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Turn the set on and tune in a TV station, preferably with a test pattern. Turn the horizontal hold control adjustment (located on rear cover) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L55) located on tube side of chassis.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

SPARTON MODELS 21CL12, U, 21CL13, U, 21CM11, U, 21CM12U, 21CM13, U, 21TL10, U, 21TM10, U (Ch. 15V215, P, T, 16U215, P, T)

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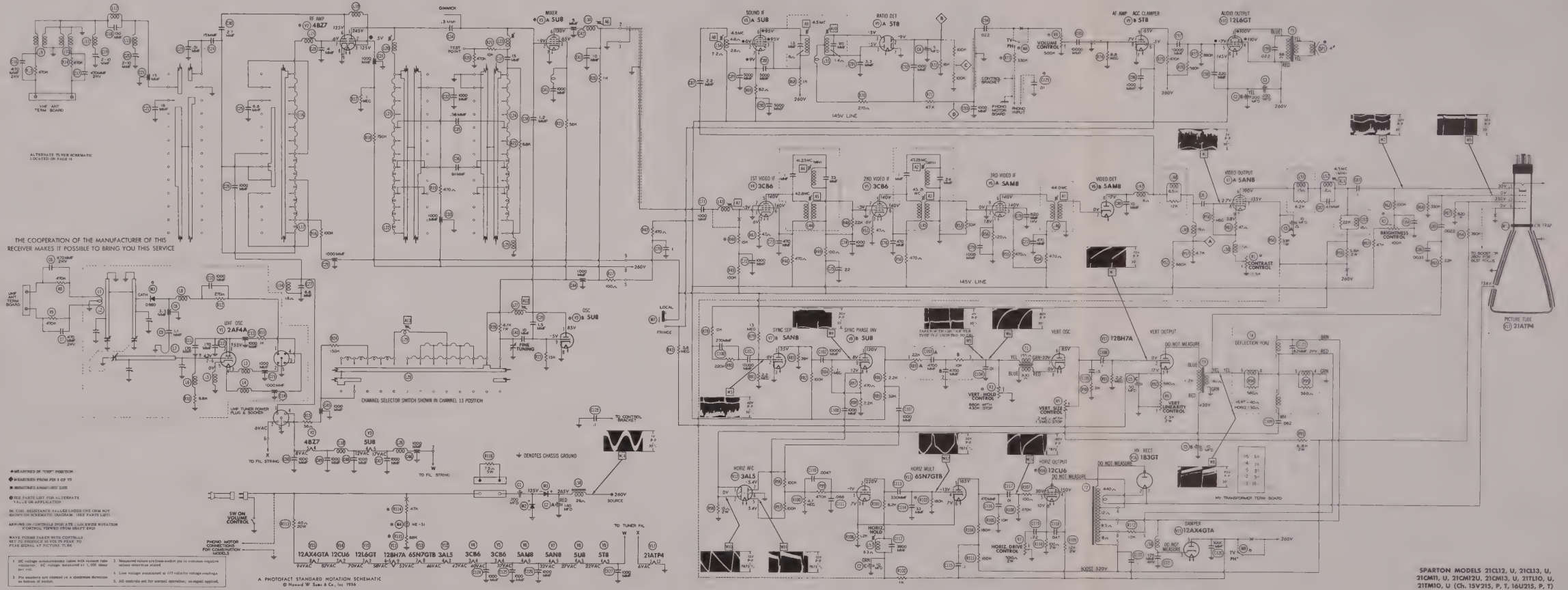
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
ALTERNATE TUNER SCHEMATIC LOCATED ON PAGE 18
VHF ANT. TERM BOARD
UHF ANT. TERM BOARD
UHF OSC V1 2AF4A
UHF TUNER POWER PLUG & SOCKET
RF AMP V7 4BZ7
MIXER V8 A 5U8
OSC V8 B 5U8
FINE TUNING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
TO CONTROL BRACKET
TO FIL STRING
4BZ7
5U8
DENOTES CHASSIS GROUND
260V SOURCE
SW ON VOLUME CONTROL
PHONO MOTOR CONNECTIONS FOR COMBINATION MODELS
TO TUNER FIL
12AX4GTA 12CU6 12L6GT 12BH7A 6SN7GTB 3AL5 3CB6 3CB6 5AN8 5AN8 5U8 5T8 21ATP4
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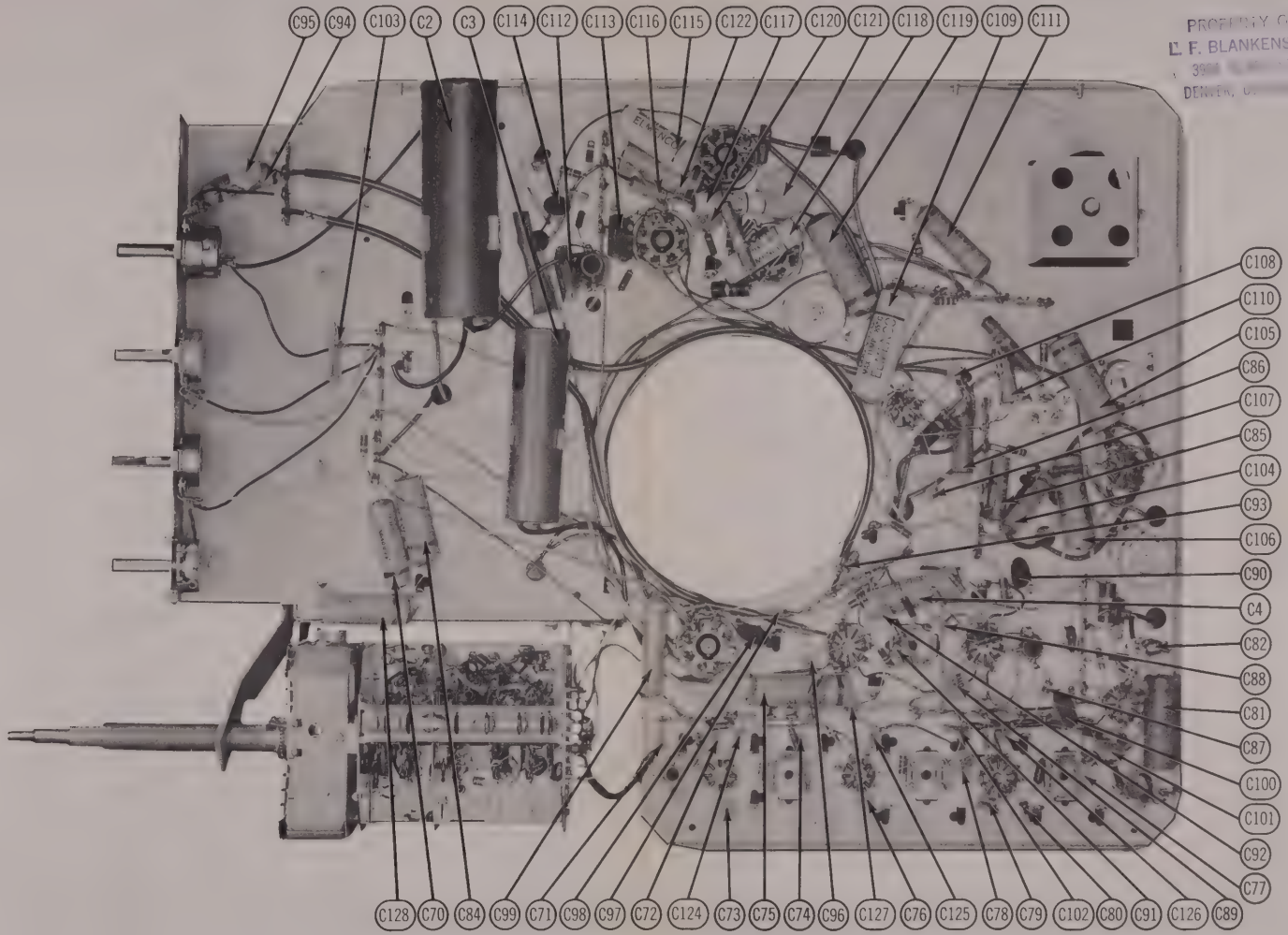
SOUND IF V5 A 5U8
RATIO DET V5 A 5T8
AF AMP AGC CLAMPER V6 B 5T8
AUDIO OUTPUT V11 12L6GT
VOLUME CONTROL 500K
CONTROL BRACKET
PHONO MOTOR BOARD
PHONO INPUT
145V LINE
1ST VIDEO IF V4 3CB6
2ND VIDEO IF V5 3CB6
3RD VIDEO IF V6 A 5AM8
VIDEO DET V6 B 5AM8
VIDEO OUTPUT V7 A 5AN8
CONTRAST CONTROL
BRIGHTNESS CONTROL 100K
TO BOOST "B" 260V FOR BEST FOCUS
PICTURE TUBE V21 21ATP4
SYNC SEP V7 B 5AN8
SYNC PHASE INV V8 B 5U8
VERT. HOLD CONTROL 680K with 430K STOP
VERT. SIZE CONTROL 2.2MEG with 1.5MEG STOP
VERT OSC V11 12BH7A
VERT OUTPUT
DO NOT MEASURE
VERT. LINEARITY CONTROL 2.5K
DEFLECTION YOKE
VERT. - 40 ~ HORIZ. 130 ~
HV RECT V16 1B3GT
HV TRANSFORMER TERM BOARD
HORIZ AFC V12 3AL5
HORIZ MULT V13 6SN7GTB
HORIZ OUTPUT V14 12CU6
HORIZ HOLD
HORIZ. DRIVE CONTROL 100K
DAMPER V17 12AX4GTA
BOOST 520V
TV PH
TV FINE TUNING
CRT TRAP
MEASURED IN "TEST" POSITION
MEASURED FROM PIN 2 OF V3
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM KNOB END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

SPARTON MODELS 21CL12, U, 21CL13, U, 21CM11, U, 21CM12U, 21CM13, U, 21TL10, U, 21TM10, U (Ch. 15V215, P, T, 16U215, P, T)



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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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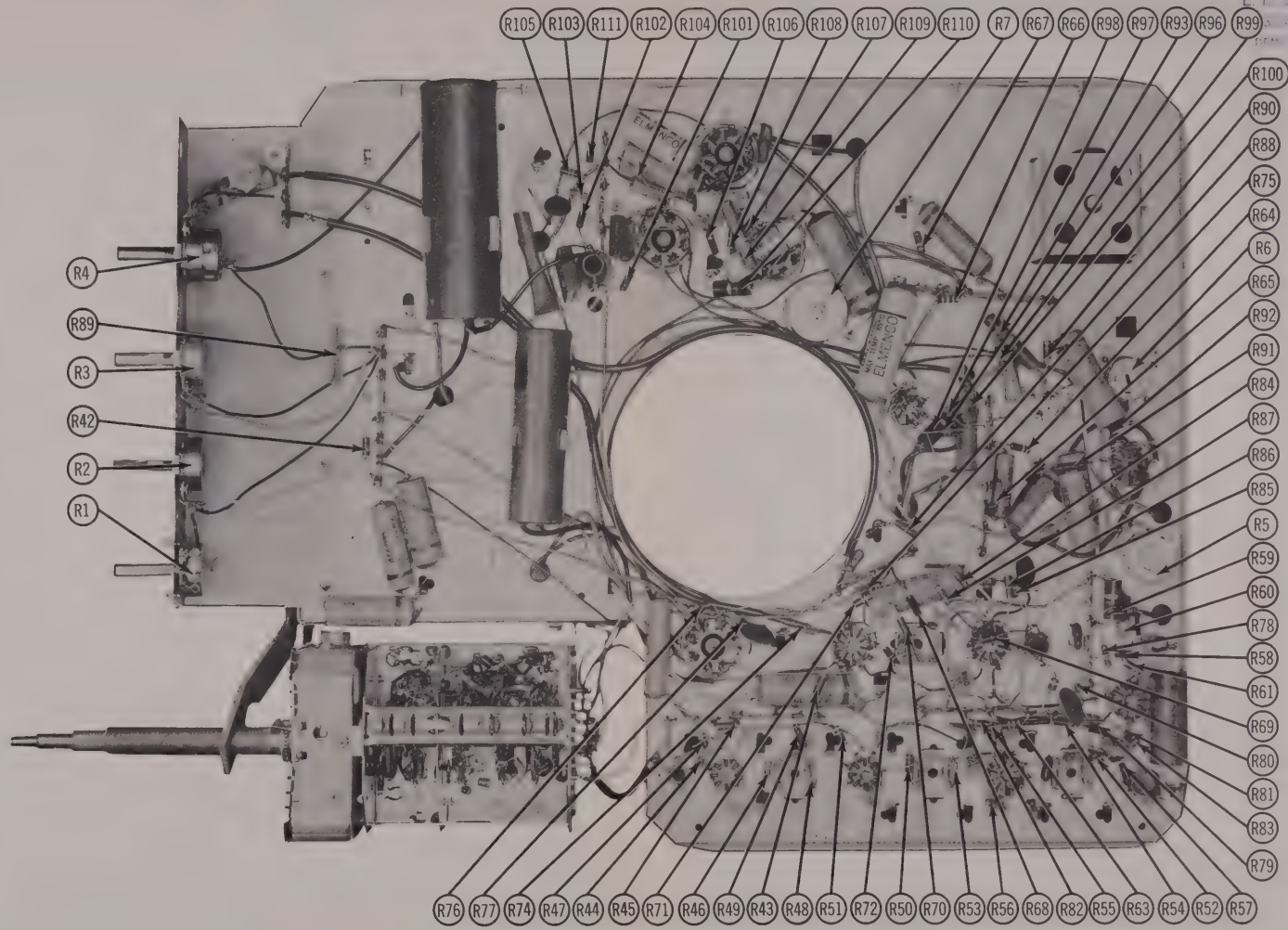
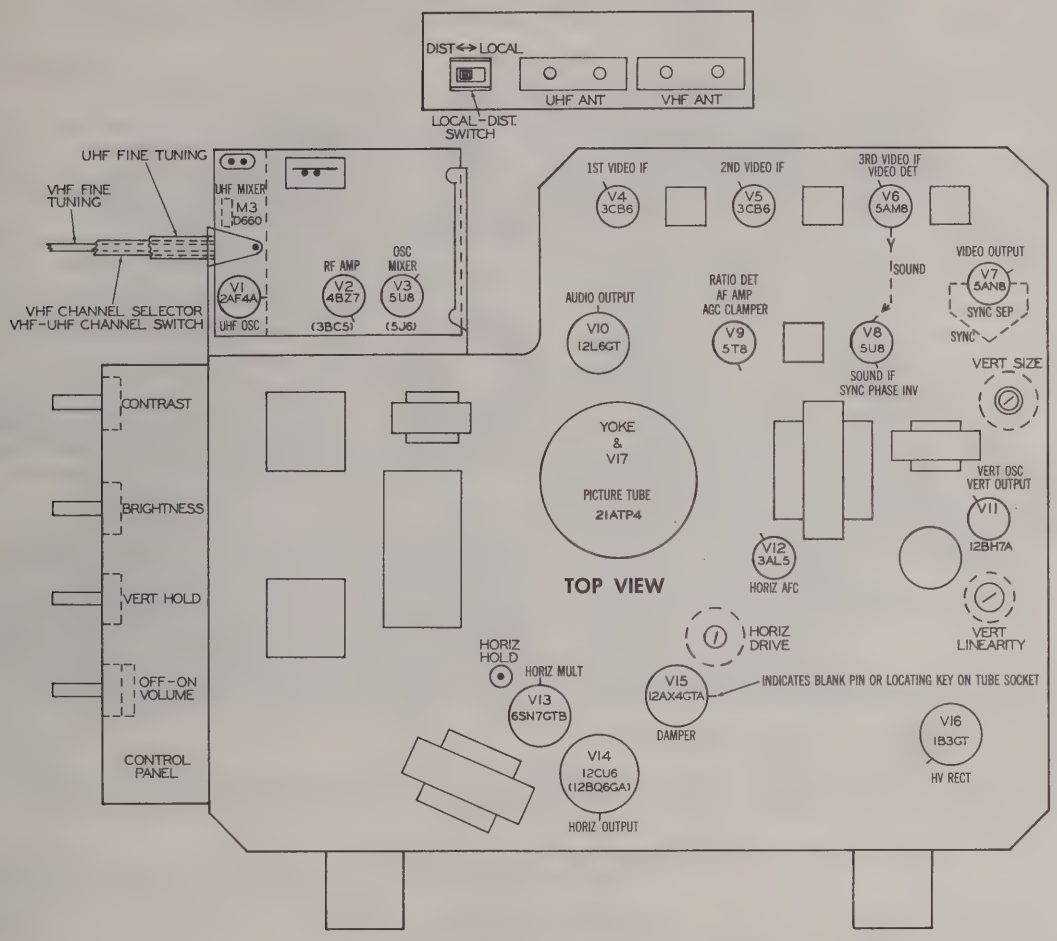


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

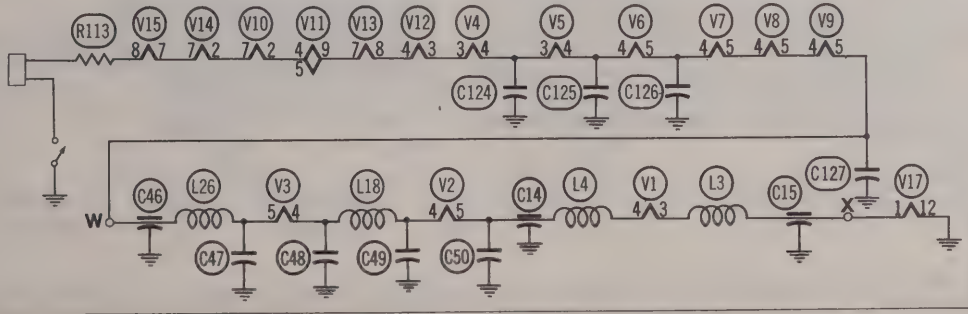
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V10 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V17**
Has pic, no sound - **V8, V9, V10**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V8, V11**
No horiz. sync - **V8, V12, V13**
No vert. or horiz. sync - **V7, V8**

SWEEP FAILURE
No raster, has sound - **V13, V14, V15, V16, V17**
No vertical deflection - **V11**
Poor vert. linearity or foldover - **V11**
Poor horiz. linearity or foldover - **V13, V14, V15**
Narrow picture - **V13, V14, V15, V16, M1, M2**
Vert. off freq. - **V8, V11**
Horiz. off freq. - **V8, V12, V13**

NOTE: Since this receiver employs tubes used in series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative (See circuit below).



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SET 311 FOLDER 15

SPARTON MODELS 21CL12, U, 21CL13, U, 21CM11, U, 21CM12U, 21CM13, U, 21TL10, U, 21TM10, U (Ch. 15V215, P, T, 16U215, P, T)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage. Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect negative lead of 3.5 volt bias battery to the ungrounded side of C75. Connect positive lead to chassis. Use only enough generator output to provide usable indication on scope. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 3CB6 (V4). Low side to chassis.	Not used	44MC	12	USE VTVM. DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	"	47.25MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	"	45.2MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	"	41.25MC	"	"	A4	Adjust for MINIMUM deflection.
5.	"	"	"	42.8MC	"	"	A5	Adjust for maximum deflection.
6.	Fig. 2	Thru network (Fig. 2) to antenna terminals.	213MC (10MC Swp)	41.25MC 43.0MC 45.0MC 47.25MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A6, A7	Adjust for response curve similar to Fig. 1 with marker properly located. Retouch A2 and A4 if necessary to position 47.25MC and 41.25MC markers in trap notches.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to pin 8 (plate) of 5AM8 (V6). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C4. Adjust for curve of maximum amplitude and symmetry as in Fig. 3.
8.	"	"	"	"	"	Vert. Amp. thru 10KΩ to point (D). Low side to chassis.	A10	Reconnect C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001MFD	High side to pin 8 (plate) of 5AM8 (V6). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (B). Common to chassis.	A8, A9	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (D). Common to point (C).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Connect short clip lead from pin 2 of V6 to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig. 5) to pin 11 (cathode) of picture tube. Common to chassis.	A11	Adjust for MINIMUM deflection. Remove clip lead from V6 socket. If 2 positions are found at which A11 will resonate, use setting farthest from chassis.

VHF OSCILLATOR ALIGNMENT

Set channel selector to the highest channel available in that area. Adjust contrast and volume controls for a normal picture. Set the fine tuning at the center of its range. With a non-metallic alignment tool, adjust A12 for the clearest sound and the sharpest detail in the picture. Check all other channels from 7 to 13, receivable in that area and make slight compromise adjustments of A12 if necessary for best reception on all high band channels. For low band channels, set station selector switch to the highest low band channel (2 to 6) and adjust A13 for the clearest sound and picture.

VHF RF ALIGNMENT

The RF portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

UHF ALIGNMENT

The UHF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver is not recommended in the field.

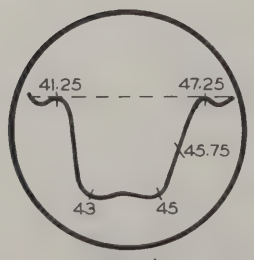


FIG. 1

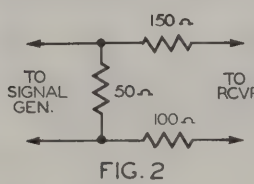


FIG. 2

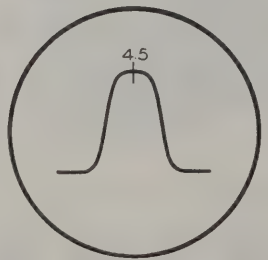


FIG. 3

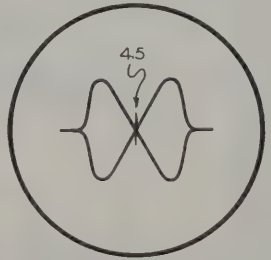
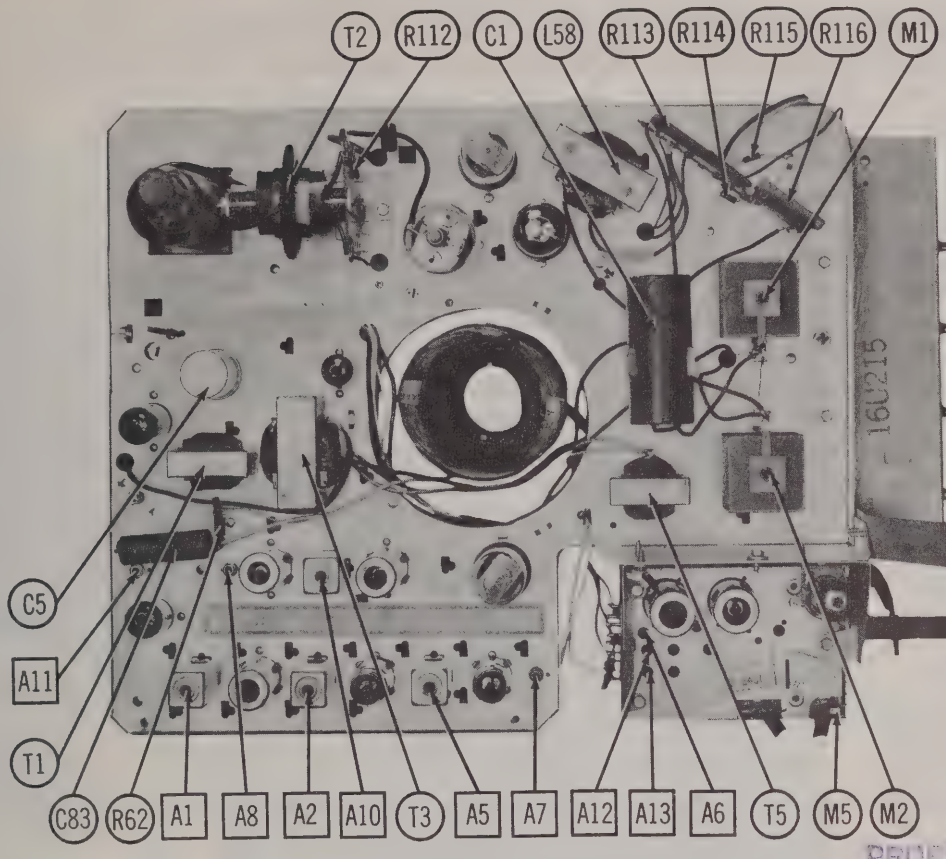
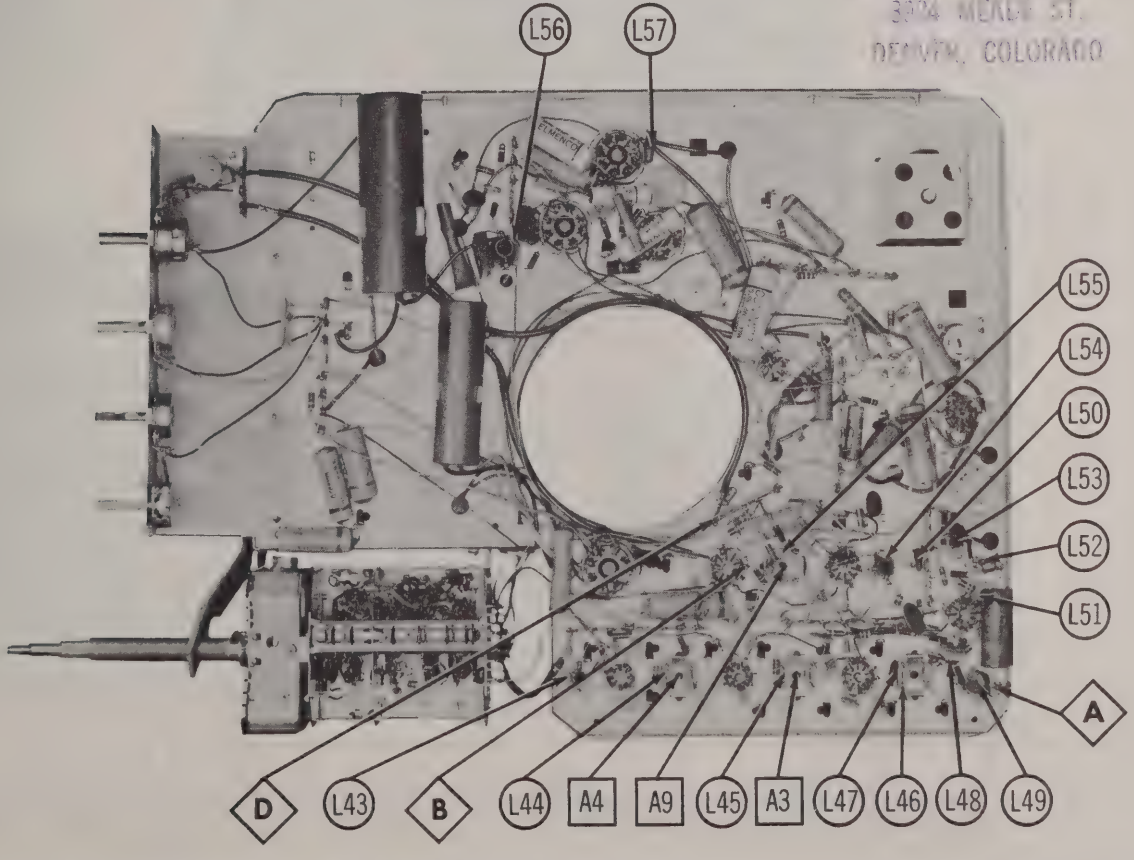


FIG. 4



CHASSIS TOP VIEW

PROPERTY OF
E. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

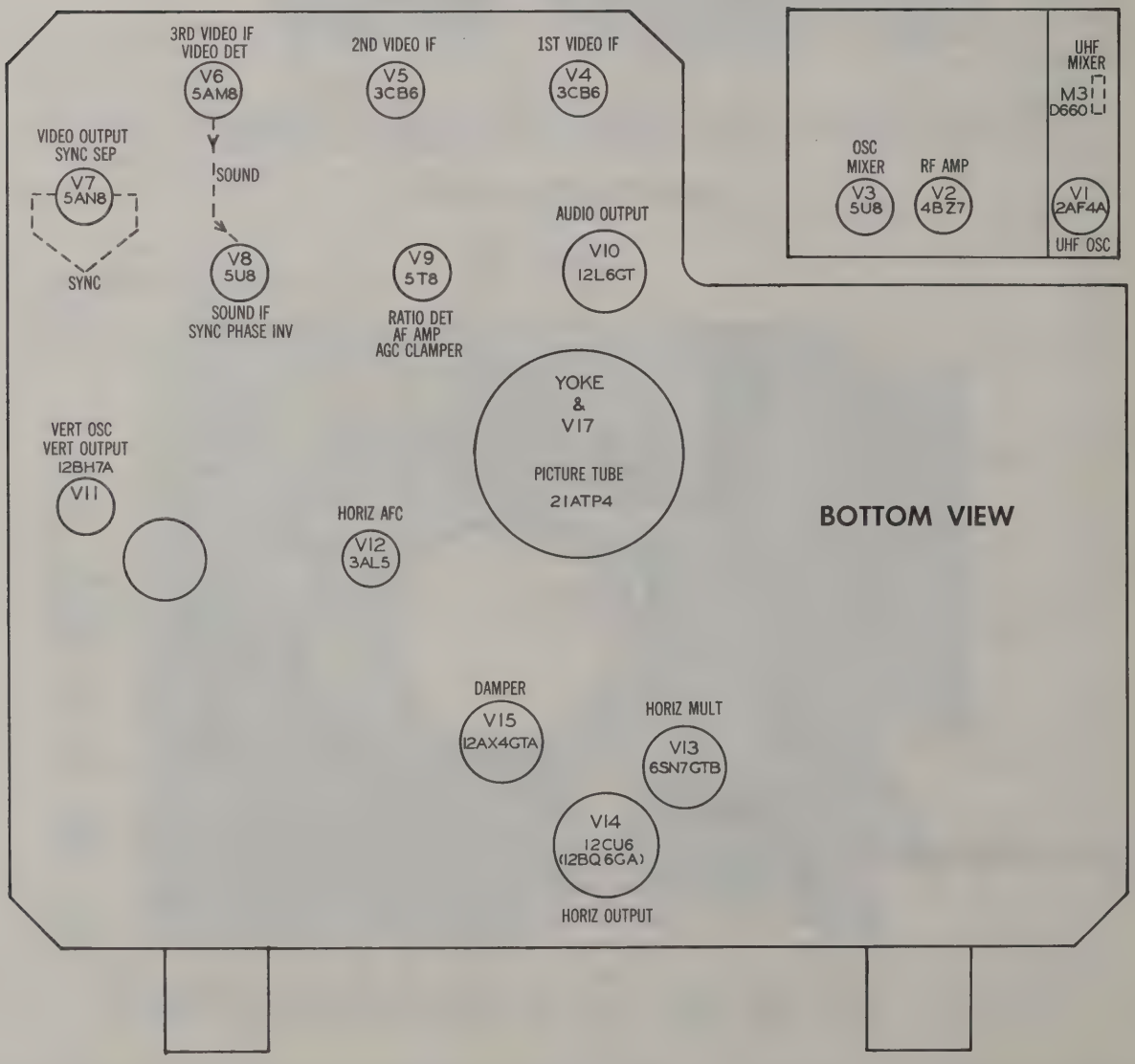


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2AF4A	*■ 6.3KΩ	6.8KΩ	2Ω	3Ω	0Ω	6.8KΩ	*■ 6.3KΩ		
V2	4BZ7	† 500Ω	400KΩ	INF	4Ω	3Ω	INF	800KΩ	0Ω	0Ω
V3	5U8	■ 5.3KΩ	480KΩ	■ 56KΩ	4Ω	5Ω	■ 1.6KΩ	0Ω	0Ω	15KΩ
V4	3CB6	700KΩ	47Ω	11Ω	10Ω	■ 470Ω	■ 470Ω	0Ω		
V5	3CB6	700KΩ	47Ω	10Ω	9Ω	■ 470Ω	■ 470Ω	0Ω		
V6	5AM8	120Ω	.2Ω	■ 470Ω	9Ω	8Ω	■ 470Ω	.2Ω	4.7KΩ	0Ω
V7	5AN8	■ 50KΩ	2.2Meg	0Ω	8Ω	7Ω	† 5.6KΩ	† 33KΩ	1Meg	250Ω
V8	5U8	■ 6KΩ	50KΩ	† 1KΩ	7Ω	6Ω	† 1KΩ	50KΩ	2.7KΩ	1Meg
V9	5T8	INF	18KΩ	INF	6Ω	5Ω	5Meg	0Ω	6.8Meg	† 470KΩ
V10	12L6GT	NC	15Ω	† 190Ω	† 29Ω	300KΩ	NC	17Ω	50KΩ	
V11	12BH7A	† 8KΩ	2.2Meg	1.2KΩ	15Ω	15Ω	◓ 1Meg	370KΩ	800Ω	13Ω
V12	3AL5	15Ω	15Ω	11Ω	12Ω	4.8Meg	0Ω	4.8Meg		
V13	6SN7GTB	5Meg	† 8.3KΩ	1.2KΩ	180KΩ	◓ 280KΩ	1.2KΩ	13Ω	12Ω	
V14	12CU6	NC	17Ω	TP	† 12KΩ	470KΩ	TP	19Ω	100Ω	TOP CAP ◓ 12Ω
V15	12AX4GTA	NC	TP	550KΩ	NC	† 29Ω	NC	19Ω	22Ω	
V16	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ◓ 450Ω
V17	21ATP4	2Ω	330KΩ	PIN 6 0Ω	PIN 10 ◓ 390KΩ	PIN 11 ■ 150KΩ	PIN 12 0Ω			

* MEASURED IN "UHF" POSITION.
■ MEASURED FROM 145V LINE.
† MEASURED FROM OUTPUT OF M1.
◓ MEASURED FROM PIN 3 OF V15.



TUBE PLACEMENT CHART

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

PROPERTY OF
L. F. BLANKENSHIP
3614 MEADE ST.
DENVER, COLORADO

ITEM No.	USE	REPLACEMENT DATA		NOTES
		SPARTON PART No.	STANDARD REPLACEMENT	
V1	UHF Osc.	2AF4A	2AF4A	Used in Chassis 16U215, P, T only.
V2	RF Amp.	4BZ7	4BZ7	3BC5 used in Chassis 15V215, P, T only.
V3	Osc. -Mixer	5U8	5U8	5J6 used in Chassis 15V215, P, T only.
V4	1st Video IF Amp.	3CB6	3CB6	
V5	2nd Video IF Amp.	3CB6	3CB6	
V6	3rd Video IF Amp. - Video Det.	5AM8	5AM8	
V7	Video Output-Sync Sep.	5AN8	5AN8	
V8	Sound IF Amp. -Sync Phase Inv.	5U8	5U8	
V9	Ratio Det. -AF Amp. - AGC Clamper	5T8	5T8	
V10	Audio Output	12L6GT	12L6GT	
V11	Vert. Osc. -Vert. Output	12BH7A	12BH7A	
V12	Horiz. AFC	3AL5	3AL5	
V13	Horiz. Mult.	6SN7GTB	6SN7GTB	
V14	Horiz. Output	12CU6	12CU6	12BQ6GA may be used as an alternate.
V15	Damper	12AX4GTA	12AX4GTA	
V16	HV Rect.	1B3GT	1B3GT	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	SPARTON PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V17	21ATP4 ①	21ATP4 ①	21ATP4 ① 21ATP4 ①	21ATP4 ②	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SPARTON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	200	200	PB40644-1	E59B294	XB010	WS342	TD-200-200	D-100	R1646
C2A	140	300	PB40644-4			WT449		Q-225	
B	200	150				TC62		S-110	
C	10	300							
C3	200	150	PB40644-2	PR2-100	XB010	WS342	TD-200-200	S-110	R1646
C4	5	50	PA4308-2	PRS150V4	BR550	TD30	TD-5-50	MMT-0505	TVA-1303
C5A	▲10	250	PA4300-12	AFH3-138	C097	FP366	TM-D10-450	T-695	TVL-3749
B	■10	450					TD-50-50		
C	50	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	470	2000	PA4334-10	HVD-30-470	DD30-471	V2T47	3KV-471	DC30347	20GA-T47	
C7	470	2000	PA4334-10	HVD-30-470	DD30-471	V2T47	3KV-471	DC30347	20GA-T47	
C8	3.3									
C9	1.1			NP0-SI1	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C10	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C11	170									
C12	170									
C13	1000			EF-001	MFT-1000				503C-D1	
C14	1000			EF-001	MFT-1000				503C-D1	
C15	1000			EF-001	MFT-1000				503C-D1	
C16	470	2000	PA4334-10	HVD-30-470	DD30-471	V2T47	3KV-471	DC30347	20GA-T47	
C17	470	2000	PA4334-10	HVD-30-470	DD30-471	V2T47	3KV-471	DC30347	20GA-T47	
C18	150			BPD-00015	DD-151	G046	811-151	UC-5315	5GA-T15	
C19	2-10				829-10					
C20	2-10				829-10					
C21	15									
C22	18			SI18	DD-180	TP12	GP1K-180	UC-5418	5GA-Q18	
C23	.51				TCZ-R5	TZ01	NP0A-0R5			
C24	15			SI15	DD-150	G021	831-150	UC-5415	5GA-Q15	
C25	6.8			NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C26	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C27	6.8			NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C28	4									
C29	1000			EF-001	MFT-1000				503C-D1	
C30	2.7									
C31	1000			EF-001	MFT-1000				503C-D1	
C32	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	1000			EF-001	MFT-1000				503C-D1	
C34	.3									
C35	.56									
C36	.91			NP0-SI1	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C37	15			SI15	DD-150	G021	831-150	UC-5415	5GA-Q15	
C38	1.2									
C39	1.5									
C40	10									
C41	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	5									
C43	110			SI110		G043	GP2K-111			
C44	1000			EF-001	MFT-1000				503C-D1	
C45	1000			EF-001	MFT-1000				503C-D1	
C46	1000			EF-001	MFT-1000				503C-D1	
C47	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C49	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C50	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C51	470	2000	PA4334-10	HVD-30-470	DD30-471	V2T47	3KV-471	DC30347	20GA-T47	
C52	470	2000	PA4334-10	HVD-30-470	DD30-471	V2T47	3KV-471	DC30347	20GA-T47	
C53	22			SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C54	470			SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C55	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C56	.47				TCZ-R5	TZ01	NP0A-0R5			
C57	.33									
C58	.33									

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No	SPRAGUE PART No.	NOTES
				REPLACEMENT DATA						
C59	1000			BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C60	33			NP0-S133	TCZ-33	TZ1S	NP01-.330	DZ-5433	5TCC-Q33	
C61	1.5			NP0-S2.5	TCZ-1R5	TZ0H	NP0A-1R5	DZ-5158	5TCCB-V15	
C62	10									
C63	15									
C64	10			N750-S10	TCZ-10	TN01	N750A-100	NT-541	5TCU-Q1	
C65	150			SI150	D6-151	TP3S	GP5K-151	UC-5218	5GA-T15	
C66	1000			BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C67	1000									
C68A	1000			BPD-2X001	DD3-102	DK069	812-001	DCD-521	5BK-DD1	
B	1000									
C69A	1000			BPD-2X001	DD3-102	DK069	812-001	DCD-521	5BK-DD1	
B	1000									
C70	.1	200	PC45GK-104	P588N-1	DF-104	CUB3P1		PT401	3TM-P1	
C71	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C72	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C73	470		PA4334-13	BPD-00047	DD-471	KD60	831-471	UC-5347	5GA-T47	
C74	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C75	22	200	PC45GK-224	P588N-22		CUB3P22		PT4022	3TM-P22	
C76	470		PA4334-13	BPD-00047	DD-471	KD60	831-471	UC-5347	5GA-T47	
C77	470		PA4334-13	BPD-00047	DD-471	KD60	831-471	UC-5347	5GA-T47	
C78	620	1000	PA4334-9							
C79	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C80	10		PA4336-16	NP0-S10	TCZ-10	TZ0S	NP0A-100	ZT-541	5TCC-Q1	
C81	1	400	PC45GL-104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C82	47		PC39A-4709	NP0-S147	TCZ-47	TZ0S	NP0-338-470	ZT-5447	5TCC-Q47	
C83	.1	600	PC45GM-104	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C84	.1	400	PC45GL-104	P468N-1	DF-104	CUB4P1		PT401	4TM-P1	
C85	.0033	400	PC45GL-332	SI2300	D6-332	CUB6D23	GP2-333-322	PT6232	6TM-D32	
C86	.0033	400	PC45GL-332	SI3300	D6-333	CUB6D33	GP2-333-322	PT6233	6TM-D33	
C87	2.2		PA4336-2	TCZ-2R2	TZ0S-2R2	NP0A-2R2			5TCC-T22	
C88	5000		PA4334-1	BPD-005	DD-502	KD60	811-005	DC-525	5BK-D5	
C89	5000		PA4334-1	BPD-005	DD-502	KD60	811-005	DC-525	5BK-D5	
C90	5000		PA4334-1	BPD-005	DD-502	KD60	811-005	DC-525	5BK-D5	
C91	3.3		PA4336-4	NP0-S3.3	TCZ-3R3	TZ0S	NP0A-3R3	ZT-5333	5TCCB-V33	
C92	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C93	1000		HM36M-102	SI1000	D6-102	TP3S	GP2L-102	UC-521	5BK-DI	
C94	.022	400	PC45CL-223	BPD-03	DD-303	CUB4S22	S17-03	PT4223	4TM-S22	
C95	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C96	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C97	10000		PA4334-2	BPD-01	DD-103	KD61	S2L-01	DC-51	5BK-D1	
C98	220		PC34R-221A	N750-S1220	TCN-220	TN30	N750-337-221		5TCU-T22	
C99	.022	600	PC45GM-223	BPD-03	DD-303	CUB6S22	S17-03	PT6223	6TM-S22	
C100	270		PC34R-271A	N750-S1270	TCN-270	TN30	N750-337-271		5TCU-T27	
C101	10000		PA4334-2	BPD-01	DD-103	KD61	S2L-01	DC-51	5BK-S1	
C102	10000		PA4334-2	BPD-01	DD-103	KD61	S2L-01	DC-51	5BK-S1	
C103A	4700		*	4PA-S3	4PC-106	KD79	S1I-0047	DC-525	5BK-D47	
B	4700						S1I-0047	DC-525	5BK-D47	
C104	.01	400	PC45EL-103	BPD-01	D6-103	CUB4E1	GP3-333-103	PT401	4TM-E1	
C105	.15	400	PC45FL-154	PT4015		CUB4P15		PT4015	4TM-P15	
C106	.1	400	PC45GL-104	PT401	DF-104	CUB4P1		PT401	4TM-P1	
C107	1000		PA4334-11	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C108	1000		PA4334-11	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C109	.047	600	PC45FM-473							
C110	.0047	200	PC45GK-472	SI4700	D6-472	CUB5D47	GP3-333-472	PT5247	5TM-D47	
C111	.068	300	PC45FK-683							
C112	3900	500	MC82F-392	1484-0039		IHSD39		MC8463	MS-339	
C113	330	500	MC82E-331	1498-00033		SR5T33			MS-333	
C114	33		PC34A330F	NP0-S133	TCZ-33	TZ0S	NP01-330	ZT-5433	5TCC-Q33	
C115	.1	400	PC45GL-104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C116	470	500	MC82E-471	1486-00047		SR5T47		MC8245	MS-347	
C117	.01	800	PC45GM-103	BPD-01	D6-103	CUB6E1	GP3-333-103	PT601	6TM-E1	
C118	.047	400	PC45GL-473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C119	.22	300	PC45GK-224	P388N-22		CUB3P22		PT4023	3TM-P22	
C120	5000		PA4334-1	BPD-005	DD-502	KD60	811-005	DC-525	5BK-D5	
C121	125	4000	PA4334-12							
C122	.1	400	PC45GL-104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C123	82	3000			DD30-820				20GA-Q82	
C124	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C125	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C126	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C127	1000		PA4334-8	BPD-001	DD-102	KD69	801-001	DC-521	5BK-DI	
C128	.1	600	PC43GL-104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C129	.01	600	PC43GL-103	BPD-01	D6-103	CUB4E1	GP3-333-103	PT401	4TM-E1	Note 1

Note 1. Used only in combination models.
* Items C103A, C103B, R89A and R89B are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	SPARTON PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
				REPLACEMENT DATA				
R1A	1500Ω	½	PA4480	AB-515		QIT-1031	U-5	Contrast-See Note 1
B	Shaft		Not Req. ⑥	AK-3		Not Req.	Not Req.	Attach to R1A.
R2A	100KΩ	½	PA4481	B-40	A47-100K-S	Q11-128	TA15L	Brightness-See Note 2
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	680KΩ	½	PA4479	B-59 *	A47-500K-S *	Q11-133 *	TA55L *	Vertical Hold Stop at 430KΩ
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A-See Note 3
R4A	500KΩ	½	PA4476	AB-50	A47-500K-Z	Q13-123	U-48	Volume-See Note 4
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R4A.
C	Switch		Not Req.	AS-1	SWS-12	Not Req.	US-28	Attach to R4A.
R5A	2Meg	½	PA4478	AB-742 *	A47-1.5Meg-B *	Q11-138 *	TA155L *	Vert. Size Stop at 1.5Meg
B	Shaft		Not Req.	AK-1	FK8-1/4	Not Req.	Not Req.	Attach to R5A.
R6	2500Ω	2	PC70024-4		Not Req.	WP3S500	R2500L	Vert. Linearity (Wire Wound)
R7	500Ω	2	PC70024-3		3W-500	WP3S500	R500L	Horiz. Drive (Wire Wound)

Note 1. Part No. PA4483 used in models 21CL12, 21CL13U, 21CM12, 21CM12U.
Note 2. Part No. PA4445-4 used in Models 21CL12, 21CL12U, 21CM13, 21CM12U.
Note 3. Part No. PA4482 used in Models 21CL12, 21CL13U, 21CM12, 21CM12U.
Note 4. Part No. PA4484 used in Models 21CL12, 21CL13U, 21CM12, 21CM12U.
* Connect a 270KΩ resistor in series with the right hand terminal of the control, the lead connecting to the same terminal of the original control, (control viewed from shaft end, terminals down).
* Connect a 470KΩ resistor in series with the right hand terminal of the control, the lead connecting to the same terminal of the original control, (control viewed from shaft end, terminals down).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	SPARTON PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R8	470KΩ		BR12N-474	BTS-470K	
R9	470KΩ		BR12N-474	BTS-470K	
R10	5800Ω				
R11	1000Ω			BTS-1000	
R12	270Ω			BTS-270	
R13	470KΩ		BR12N-474	BTS-470K	
R14	470KΩ		BR12N-474	BTS-470K	
R15	56Ω			BTS-56	
R16	100KΩ			BTS-100K	
R17	1Meg 5%			BTS-1Meg5%	
R18	750KΩ 5%			BTS-750K5%	
R19	470Ω			BTS-470	
R20	470KΩ			BTS-470K	
R21	10KΩ			BTS-10K	
R22	1000Ω			BTS-1000	
R23	15KΩ			BTS-15K	
R24	150KΩ				
R25	56Ω				
R26	1000Ω			BTS-1000	
R27	100Ω			BTS-100	
R28	4700Ω			BTA-4700	
R29	470KΩ		BR12N-474	BTS-470K	
R30	470KΩ		BR12N- 474	BTS-470K	
R31	10KΩ			BTS-10K	
R32	1000Ω			BTS-1000	
R33	1500Ω			BTS-1500	
R34	4700Ω				
R35	100Ω				
R36	230KΩ			BTS-230K	
R37	10KΩ				
R38	3300Ω				
R39	1000Ω			BTS-1000	
R40	13KΩ			BTS-13K	
R41	470Ω			BTS-470	
R42	470Ω		BR12N-471	BTS-470	
R43	5.6Meg		BR12S-565	BTS-5.6Meg	
R44	15KΩ				Note 1, 2
R45	100Ω		BR12N-101	BTS-100	
R46	470Ω		BR12N-471	BTS-470	
R47	47Ω		BR12S-470	BTS-47	
R48	22KΩ 5%		BR12S-223	BTS-22K 5%	
R49	100Ω		BR12N-101	BTS-100	
R50	470Ω		BR12N-471	BTS-470	
R51	47Ω		BR12S-470	BTS-47	
R52	680KΩ		BR12S-684	BTS-680K	
R53	33KΩ 5%		BR12S-333	BTS-33K 5%	
R54	470Ω		BR12N-471	BTS-470	
R55	470Ω		BR12N-471	BTS-470	
R56	12Ω		BR12S-121	BTS-120	
R57	4700Ω 5%		BR12G-472	BTS-4700 5%	
R58	1Meg		BR12N-105	BTS-1Meg	
R59	5600Ω	2	DR12S-562	BTS-5600	
R60	33KΩ		DR12S-333	BTA-33K	
R61	47Ω		BR12S-470	BTS-47	
R62	100KΩ		BR12N-104	BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	SPARTON PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R63	47KΩ		BR12N-473	BTS-47K	
R64	330KΩ		BR12N-334	BTS-330K	
R65	22KΩ		BR12N-223	BTS-22K	
R66	390KΩ		BR12S-394	BTS-390K	
R67	820KΩ		BR12S-824	BTS-820K	
R68	1000Ω		BR12N-102	BTS-1000	
R69	82Ω 5%		BR12G-820	BTS-82 5%	
R70	270Ω 5%		BR12G-271	BTS-270 5%	
R71	47KΩ		BR12S-473	BTS-47K	
R72	18KΩ		BR12S-183	BTS-18K	
R73	330KΩ		BR12N-334	BTS-330K	Note 3
R74	5.6Meg		BR12N-565	BTS-5.6Meg	
R75	470KΩ		BR12N-474	BTS-470K	
R76	560KΩ 5%		BR12G-564	BTS-560K 5%	
R77	680KΩ 5%		BR12G-684	BTS-680K 5%	
R78	10KΩ		BR12N-103	BTS-10K	
R79	15Meg		BR12N-156	BTS-15Meg	
R80	220KΩ		BR12N-224	BTS-220K	
R81	2.2Meg		BR12N-225	BTS-2.2Meg	
R82	100KΩ		BR12S-104	BTS-100K	
R83	39KΩ		BR12S-393	BTS-39K	
R84	1Meg		BR12N-106	BTS-1Meg	
R85	390KΩ		BR12S-393	BTS-390K	
R86	2200Ω		BR12S-222	BTS-2200	
R87	470Ω		BR12S-471	BTS-470	
R88	2200Ω		BR12S-222	BTS-2200	
R89A	22KΩ		*	BTS-22K	
B	10KΩ			BTS-10K	
R90	3000Ω 5%		BR13G-302	BTS-3000 5%	
R91	2.2Meg		BR12N-225	BTS-2.2Meg	
R92	680Ω		BR12N-681	BTS-680	
R93	6800Ω 2		DR12S-682	BTS-6800	
R94	560Ω				
R95	560Ω				
R96	100KΩ		BR12S-104		
R97	100KΩ		BR12S-104		
R98	150 2		DR12S-150		
R99	470KΩ		BR12N-474	BTS-470K	
R100	4.7Meg		BR12N-475	BTS-4.7Meg	
R101	8200Ω		BR12S-822		
R102	100KΩ		BR12N-104	BTS-1000	
R103	180KΩ 5%			BTS-180K 5%	Note 4
R104	180KΩ 5%		BR13G-184	BTS-180K 5%	
R105	10KΩ		BR12S-103		
R106	1200Ω 5%		BR13G-122		
R107	100Ω		BR12N-101		
R108	470KΩ		BR12N-474		
R109	12KΩ		DR-S-123	BTS-12K	
R110	100Ω		DR12S-101		
R111	100KΩ		BR12S-104		
R112	100KΩ		BR12N-103		
R113	40Ω	20	PA4200-33		
R114	47KΩ		BR12S-473	BTS-47K	Note 5
R115	68KΩ			BTS-68K	Note 5
R116	7.5Ω		PA4227		

Note 1. Some versions use a 10KΩ ½W resistor in this application (Mfgr. Part No. BR12G-103).
Note 2. In chassis type 15V21S, a 270Ω ½W resistor is used in this application (Mfgr. Part No. BR12S-271).
Note 3. Used in combination sets only.
Note 4. Some versions use a 150KΩ ½W 5% resistor in this application (Mfgr. Part No. BR12G-154).
Note 5. Some versions use a 1W resistor in this application.
Note 6. Not used in some versions.
* Items R89A, R89B, C103A, C103B are combined in one unit.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	SPARTON PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
		REPLACEMENT DATA							
T1	Vert. Osc. Trans.	AB47006-5	B6700	A-3000	209T1	V405 ①	A-811	24A67	A-95X
T2	Horiz. Output Trans.	PC70033	FB430 * ①	HVO-54 * ①	230T1 * ①	X129 * ①	A-8255 * ①	FLY-77 * ①	D-49 * ①
T3	Vert. Output Trans.	AB46073-1	T1900 ②	A-2624 ② ①		V312 ① ②	A-8141 ① ②	26B54 ① ②	A-109X ① ②
T4A	Yoke(90°)Horiz. (20MH)	PC70034	DF607 ③	MDF-97 ③	235D1 ③	Y90F19/ 43 ③	DY-16A ③	T-16 ③	Y-41-1 ③
B	Vert. (39MH)								

① Drill new mounting hole(s).
② Use 15 to 1 turns ratio.
③ Connect blue lead to plate. Connect red lead to junction of yellow yoke lead and R65. Remove green yoke lead from ground and connect it and green lead of transformer to junction of resistors R5, R95 and capacitor C87B.
④ Cut and tape yellow lead.
⑤ Use original horizontal damping network.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
①	6	6	5	9	5	6	4	5
②	7	3	4	5	4	4	3	6
③	8	NC See Note 5	NC See Note 5	NC See Notes 6 & 7	NC See Note 5	NC See Note 5	NC See Note 5	NC See Note 5
④	5	1	1	1	1/	1	1	1
Special Notes		⑧	⑧	⑧ 7	⑧	⑧	⑧	⑧

⑥ Install original horiz. damping resistor R113 in series with damping capacitor C123 across yoke term. #3 & #7.
⑦ If insufficient width, install 560MMF 4KV (Min.) across terms 5 & 1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	SPARTON PART No	Halldorson PART No	Merit PART No	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
			REPLACEMENT DATA						
T5	3.4KΩ	3.4Ω	AB44074-1	Z1001 ②	A301S ①	A3849 ①	22S45 ②	S-1X ②	① Drill new mounting holes. ② Bend ears under chassis.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP	SPARTON PART No	QUAM PART No	RCA TYPE No.	NOTES
				REPLACEMENT DATA			
SP1	4"	PM	3.4Ω	PC83005-56 ①	4A6T	233S1	① Used in Models 21CM10, 21CM10U, 21CM13, 21CM13U, 21CL13, 21CL13U.
	5"	PM	3.4Ω	PC83009-43 ②	5A6T	205S2	② Used in Models 21CM11, 21CM11U, 21CM13, 21CM13U, 21CL13, 21CL13U.
	6"	PM	3.4Ω	PC83009-57 ③	6A3I	206S2	③ Used in Models 21CM13, 21CM13U, 21CL13, 21CL13U

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	SPARTON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
				REPLACEMENT DATA				
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil	0Ω						
L3	Fil. Choke	0Ω						
L4	Fil. Choke	0Ω						
L5	Cathode Choke	0Ω						
L6	RF Coil	.6Ω						
L7	UHF Osc. Coupling Coil	0Ω						
L8	UHF If Coil	0Ω						
L9	VHF Ant. Matching Trans.	.6Ω	.6Ω					
L10	VHF Ant. Matching Trans.	.6Ω	.6Ω					
L11	IF Trap Coil	.3Ω						
L12	FM Trap Coil	0Ω						
L13	IF Trap Coil	.6Ω						
L14	UHF If Coil	1.8Ω						
L16	VHF Ant. Coil	0Ω						Channel 13
L16	VHF Ant.Coils	0Ω						
L17	UHF If Coil	0Ω						
L18	Fil. Choke	0Ω						
L19	Neut. Coil	0Ω						
L20	VHF RF Coil	0Ω						Channel 13
L21	VHF RF Coils	0Ω						
L22	UHF If Coil	0Ω						
L23	VHF Mixer Grid Coil	0Ω						Channel 13
L24	VHF Mixer Grid Coils	0Ω						
L25	UHF If Coil	0Ω						
L26	Fil. Choke	0Ω						
L27	VHF Osc. Coil	0Ω						Channel 13
L28	VHF Osc.Coils	0Ω						
L29	VHF Osc. Coil	0Ω						Channel 8
L30	Conv. Plate Ant. Matching Trans.	.3Ω .2Ω						Channel 13
L32	Ant. Coil	0Ω						
L33	Ant. Coils	0Ω						
L34	Fil. Choke	0Ω						Channel 13
L35	RF Coil	0Ω						
L36	RF Coils	0Ω						Channel 13
L37	Mixer Grid Coils	0Ω						Channel 13
L38	Mixer Grid Coils	0Ω						Channel 13
L39	Osc. Coil	0Ω						
L40	Osc. Coils	0Ω						
L41	RF Coil	0Ω						
L42	Conv. Plate	0Ω	0Ω					
L43	1st Video IF	.3Ω		AA6423-1	17-4534 *	TV-130 *	S219 *	
L44	2nd Video IF	.3Ω	.2Ω	AB43095-7				Includes 4L 22MC Trap
L45	3rd Video IF	.3Ω	.2Ω	AB43095-8				Includes 47.25MC Trap
L46	4th Video IF	.3Ω	.2Ω	AB43080-8	17-5004	TV-128	S234	
L47	Series Peaking Coil	L 8Ω		AA6830-1	19-1005		4613	10 Microhenries
L48	Series Peaking Coil	8.3Ω		AA6402-10	19-2100 ▲	TV-121 ▲	S177 ▲	100 Microhenries, Wound on 12KΩ resistor
L49	Shunt Peaking Coil	18Ω		AA6813-14	19-2400		S148	684 Microhenries
L50	RF Coil	L 1Ω		AA6402-13			S229	5.5 Microhenries
L51	Series Peaking Coil	18Ω		AA6402-12	19-2500 ▲		S136 ▲	481 Microhenries, Wound on 5.2KΩ resistor
L52	4.5MC Trap	2Ω		AA6425-1	20-1004	TV-131	1468	
L53	Shunt Peaking Coil	18Ω		AA6402-11	19-2400 ▲		S149 ▲	671 Microhenries, Wound on 22KΩ resistor Tapped @ 3.6Ω Tertiary Windings. TO 3.3 Microhenries
L54	Sound IF	7.3Ω		AA6424-1				
L55	Ratio Det.	8Ω	L 40CT	AB43080-8	17-3497	TV-116	S305	
L56	RF Choke	.5Ω		AA6850-8	19-1003		4626	

* Use one winding only.
■ Parallel with 12KΩ resistor.
▲ Parallel with 8.2KΩ resistor.
● Parallel with 22KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	SPARTON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No	Thordarson PART No	NOTES
			REPLACEMENT DATA							
L57	63Ω		AA6403-8	19-1576	TV-163	S210			85-5	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT (1000 ⁰/₀₀)	SPARTON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
				REPLACEMENT DATA					
L58	.220A	23Ω	L 23H	AB47010-2	C5033 ①	C1674 ②	C2327 ①	26C43 ②	C-21X ②

① Drill new mounting holes.
② Bend ears under chassis.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	SPARTON PART No.	Federal PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
		REPLACEMENT DATA						
M1	.220ADC	PA4224	1238A	MR300	6S300	6Q3	300	
M2	.250ADC	PA4234	1238A	MR300	6S300	6Q2	300	

PARTS LIST AND DESCRIPTIONS (Continued)

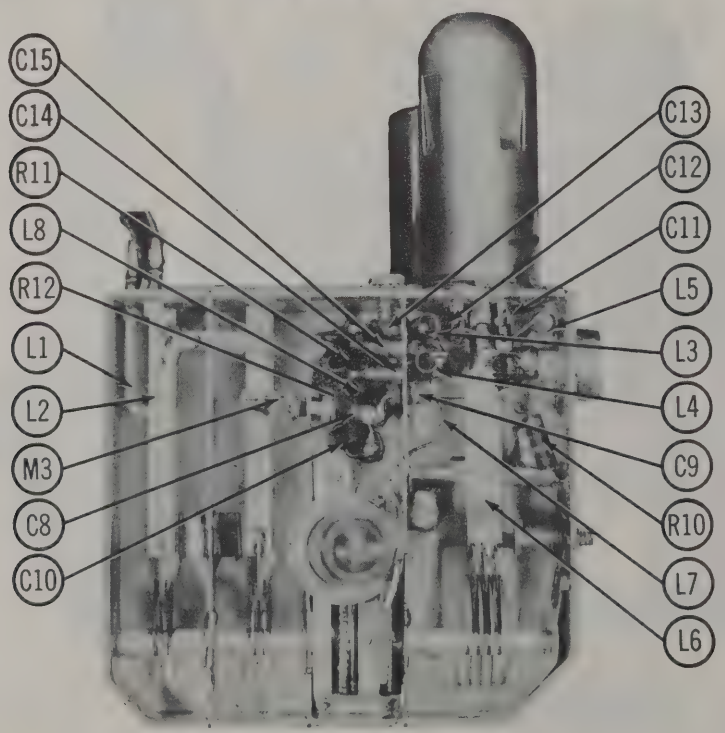
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		SPARTON PART No.	SYLVANIA PART No.	
M3	D660*		1N82A	UHF Mixer (Clip-in)

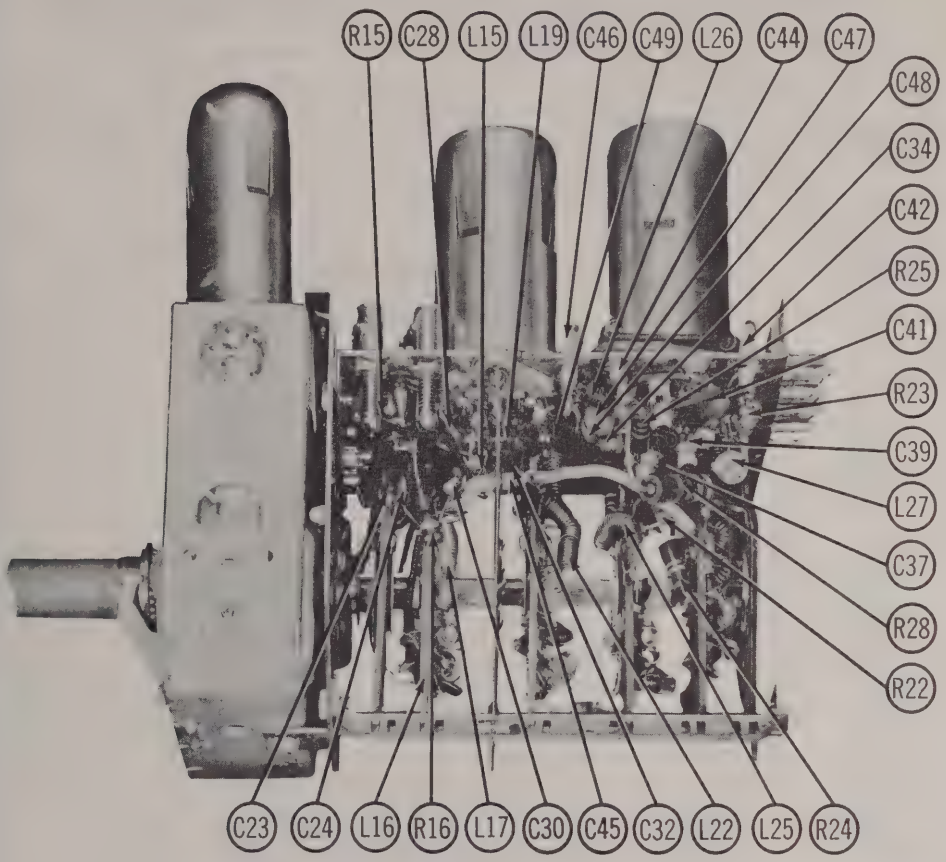
* Some versions may use crystal diode type 1N82A in this application.

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M4	Dial Light		NE51 - Not used in some versions
M5	Tuner	PD94012	VHF-UHF, Chassis 16U215, 16U215P, 16U215T
M6	Tuner	PC70035	VHF - Chassis 15V215, 15V215P, 15V215T
M7	Switch	PA4616	Fringe-local (SPST-Slide type)
M8	Switch		TV-Phono- used in models 21CM13, 21CM13U, 21CL13, 21CL13U
M9	Centering Device	PB40659	
M10	Ion Trap	PA1248-7	
	Cabinet	PD90190-2	Models 21TM10, 21TM10U
	Cabinet	PD90190-4	Models 21TL10, 21TL10U
	Cabinet	PD90191-2	Models 21CM11, 21CM11U
	Cabinet	PD90192-2	Models 21CM13, 21CM13U
	Cabinet	PD90193-2	Models 21CM12, 21CM12U
	Cabinet	PD90193-4	Models 21CL12, 21CL12U
	Cabinet	PD90192-4	Models 21CL13, 21CL13U
	Knob	PA5677	Contrast, brightness, vert. hold, on-off-volume - Models 21TM10, 21TM10U, 21TL10, 21TL10U, 21CM11, 21CM13, 21CM13U, 21CL13, 21CL13U, 21CM11U
	Knob	PA5680-1	Vert. Hold - Models 21CM12, 21CM12U, 21CL12, 21CL12U
	Knob	PA5680-2	Brightness - Models 21CM12, 21CM12U, 21CL12, 21CL12U
	Knob	PA5680-3	Contrast - Models 21CM12, 21CM12U, 21CL12, 21CL12U
	Knob	PB40658	On-off-volume - Models 21CM12, 21CL12
	Knob	PB40656	On-off-volume - Models 21CM12U, 21CL12U
	Knob	PA5678	VHF fine tuning - Models 21TM10, 21TL10, 21CM11, 21CM13, 21CL13
	Knob	PB40653-1	VHF fine tuning - Models 21TM10U, 21TL10U, 21CM11U, 21CM13U, 21CL13U, 21CM12U, 21CL12U
	Knob	PB40652-1	VHF fine tuning - Models 21CM12, 21CL12
	Knob	PB40652-1	UHF selector and fine tuning - Models 21TM10U, 21TL10U, 21TL10U, 21CM11U, 21CM13U, 21CL13U, 21CM12U, 21CL12U
	Knob	PA5679	VHF channel indicator - Models 21TM10, 21TL10, 21CM11, 21CM13, 21CL13
	Knob	PB40650	VHF channel indicator - Models 21TM10U, 21TL10U, 21CM11U, 21CM13U, 21CL13U
	Knob	PB40657	VHF channel indicator - Models 21CM12, 21CL12
	Knob	PB40655-1	VHF channel indicator - Models 21CM12U, 21CL12U
	Knob	PB40651	UHF channel indicator - Models 21TM10U, 21TL10U, 21CM11U, 21CM13U, 21CL13U
	Knob	PB40654	UHF channel indicator - Models 21CM12U, 21CL12U
	Mask & Script Assembly	AC68109-1	Models 21TM10, 21TM10U, 21TL10, 21TL10U, 21CM11, 21CM13, 21CM13U, 21CL13, 21CL13U, 21CM11U
	Mask & Script Assembly	AC68109-2	Models 21CM12, 21CM12U, 21CL12, 21CL12U
	Safety Glass	PB40628-3	Models 21TM10, 21TM10U, 21TL10, 21TL10U, 21CM11, 21CM13, 21CM13U, 21CL13, 21CL13U, 21CM11U
	Safety Glass	PC63157	Models 21CM12, 21CM12U, 21CL12, 21CL12U



UHF TUNER FRONT VIEW



UHF-VHF TUNER-RIGHT SIDE

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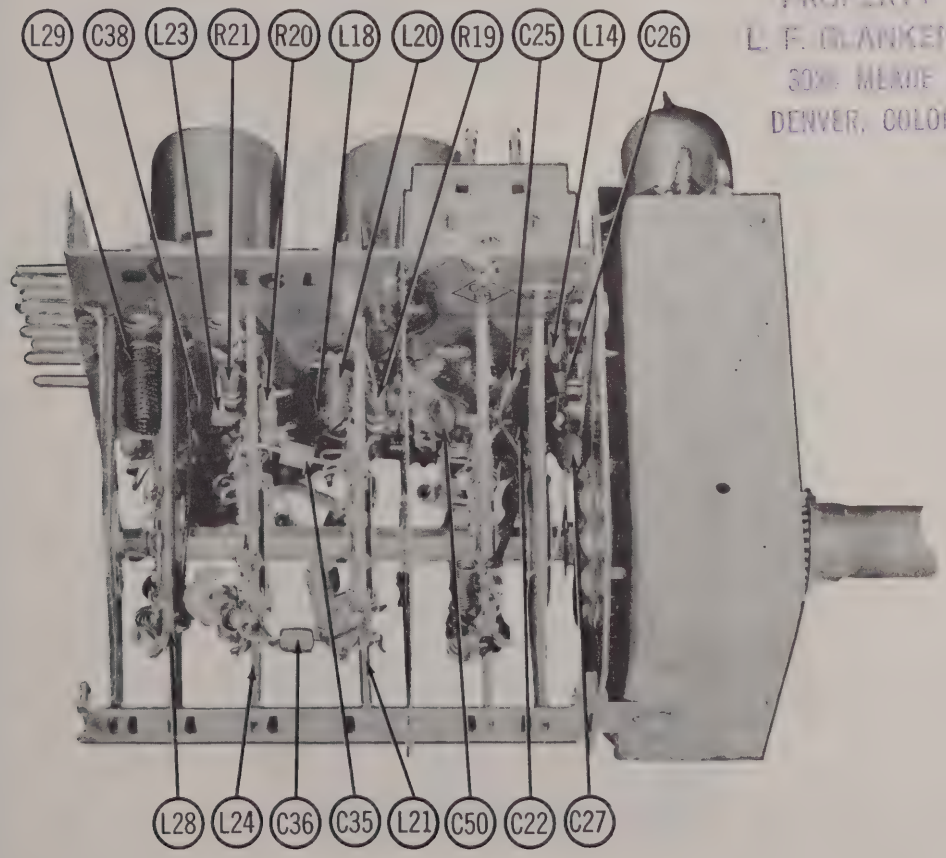
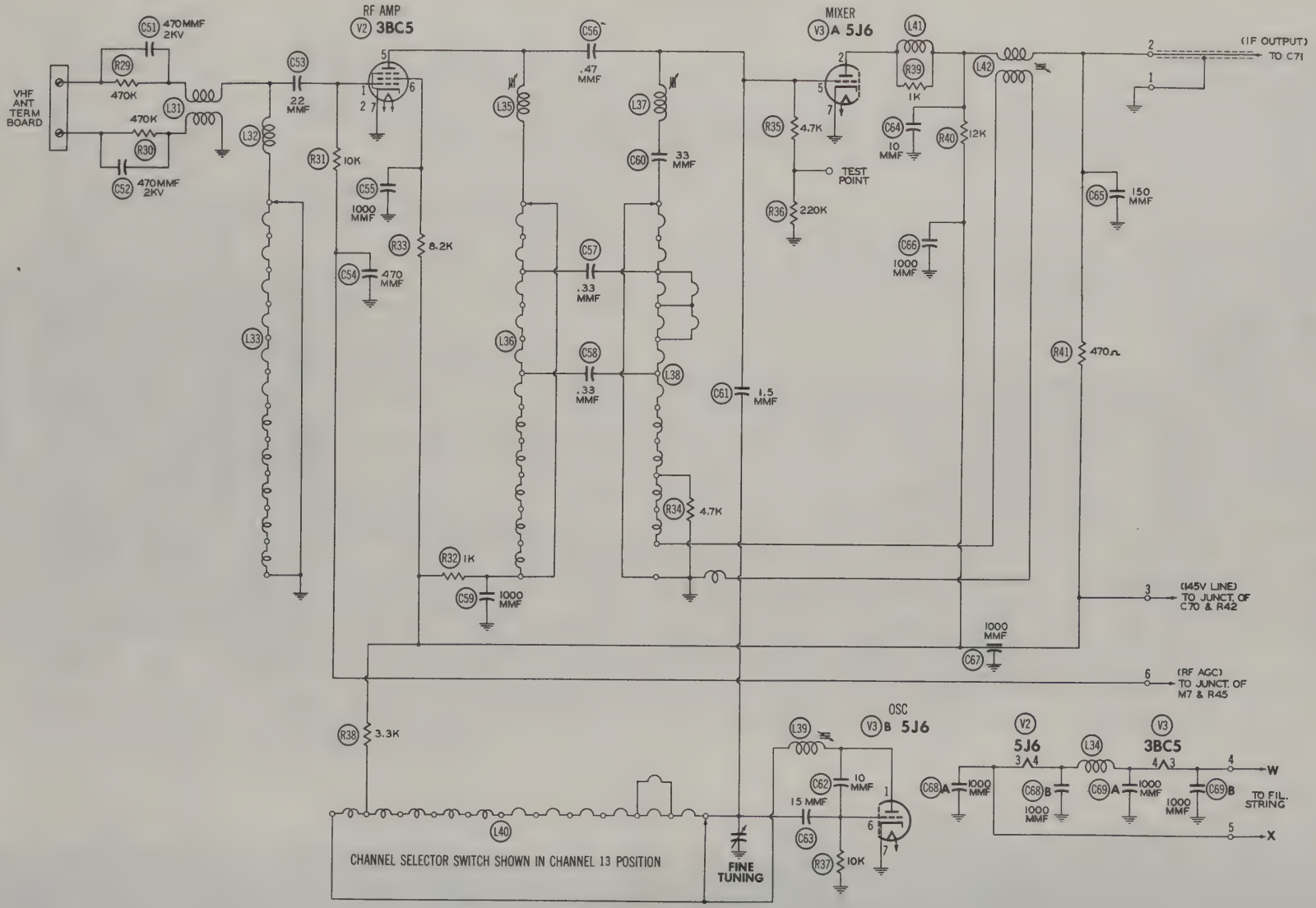
L. F. BLANKENSHIP
30[illegible] MERIDE ST.
DENVER, COLORADO



UHF-VHF TUNER-LEFT SIDE



VHF TUNER PC 70035 USED WITH CHASSIS 15V215, 15V215P, AND 15V215T

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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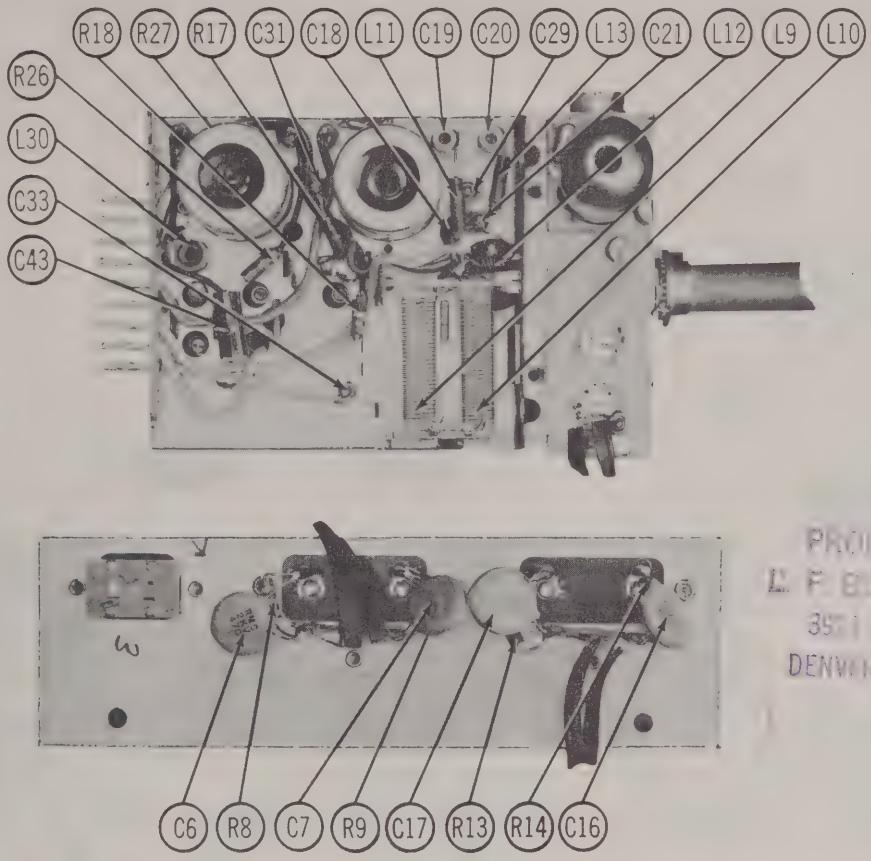
ALTERNATE VHF TUNER SCHEMATIC



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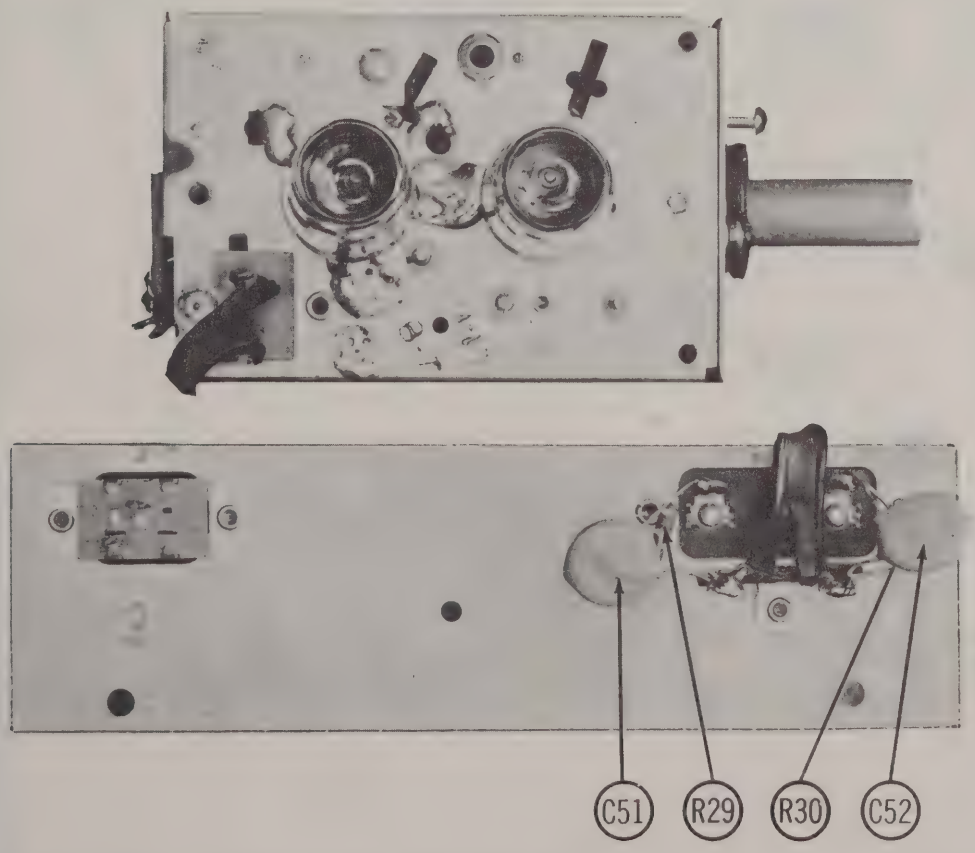
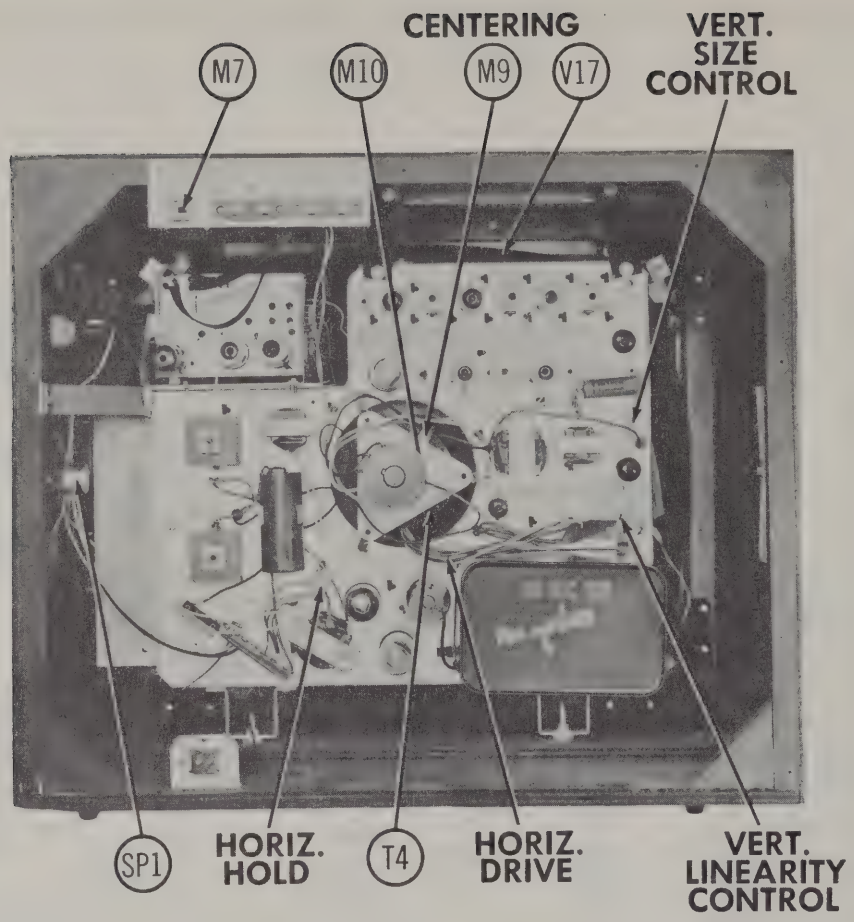
UHF-VHF TUNER TOP VIEW & ANTENNA NETWORK



VHF TUNER TOP VIEW & ANTENNA NETWORK

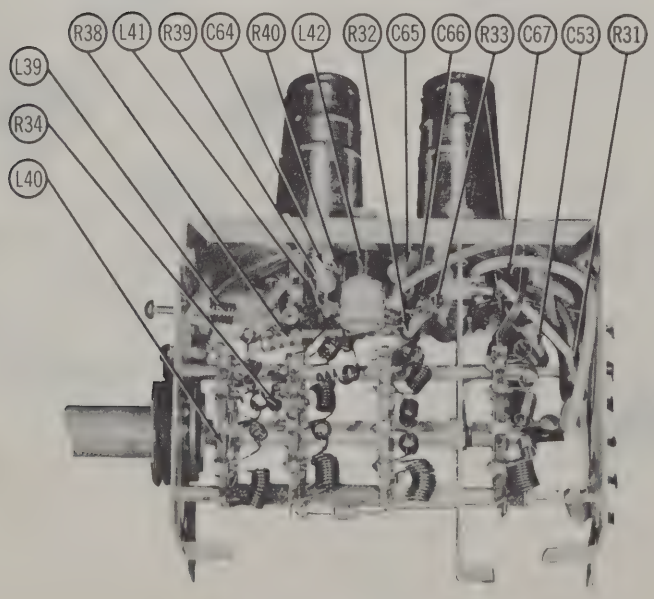


CABINET—REAR VIEW

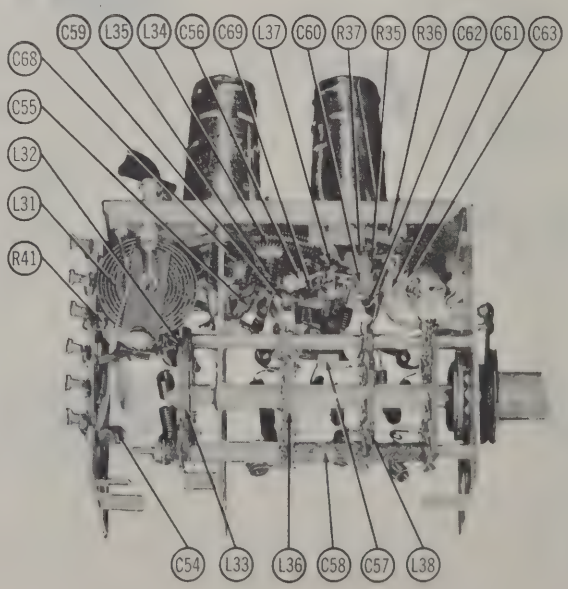
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Adjust horizontal hold control (L56) until picture synchronizes and vertical lines are straight.

Adjust horizontal drive control (R7) until compression near the center of the picture just disappears.

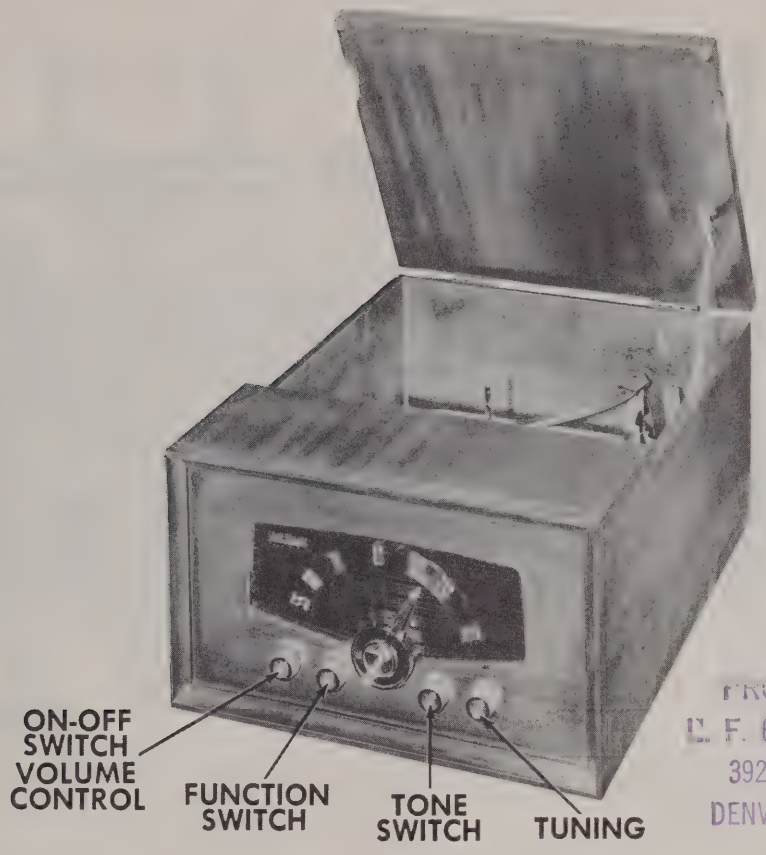


VHF TUNER RIGHT SIDE



VHF TUNER LEFT SIDE

TRAV-LER
MODEL 5510



PROPERTY OF
E. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRAV-LER
MODEL 5510

TRADE NAME	Trav-Ler Model 5510
MANUFACTURER	Trav-Ler Radio & Tel. Corp., 571 W. Jackson Blvd., Chicago, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver With 3 Speed Automatic Record Changer
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-125 Volts AC-60 Cycles — RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	550KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1610KC	"	"	A5	"
3.	"	"	540KC	Tuning gang fully closed.	"	A6	"
4.		Loop	1400KC	Tune to 1400KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 954B - PHOTOFACT SET 302 – FOLDER #12.

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PARTS LIST AND DESCRIPTIONS

TRAV-LER MODEL 5510

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		TRAV-LER PART No.	STANDARD REPLACEMENT	
V1	Converter	12BE6	12BE6	
V2	IF Amplifier	12BA6	12BA6	
V3	Det.-AVC-AF Amplifier	12AV6	12AV6	
V4	Output	50C5	50C5	
V5	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	EC-35	PRS150V5050	BBRD5515	TCD49	TDL-D50-150	MTD-1550	TVA-2453
B	50	150							
C2	5	25	EC-34	PRS150V4	BR550	TC30	TD-5-25	MMT-0505	TVA-1203

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	220		CC-33	BPD-00022	DD-221	G051	GP2K-221	UC-5322	5GA-T22	
C4	.05	400	PC-5	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C5	47		CC-12	SI47	D6-470	TP29	831-470	UC-5447	5GA-Q47	
C6	100		CC-5	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C7	.05	400	PC-5	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C8	.01	600	PC-7	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C9	3300			1464-0033		1R5D33			MS-233	
C10	150	500		NP0-SI150	TCZ-150	5R5T15		MCB236	MS-315	
C11	.01	600	PC-7	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C12	.01	600	PC-7	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C13	.047	400	PC-21	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C14	.05	400	PC-5	BPD-05	DF-503	CUB4S47		PT415	4TM-S5	

Note 1. Some versions use 100MMF in this application (part #CC-5).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	VC-4	AB-70	A47-1Meg-Z	Q13-137	U-53	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A

RESISTORS

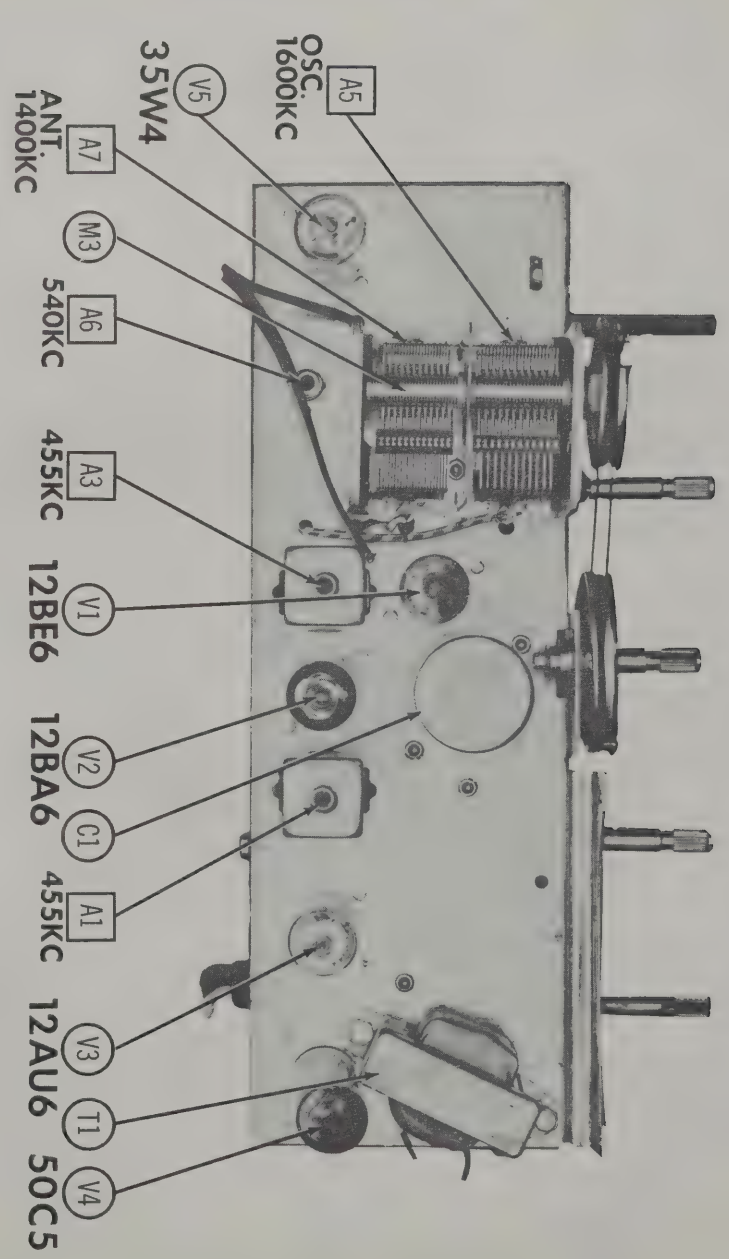
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRAV-LER PART No.	IRC PART No.	
R2	33Ω	½	IR-17	BTS-33	
R3	22KΩ	½	IR-9	BTS-22K	
R4	1Meg 5%	½	IR-12	BTS-1Meg	
R5	3.3Meg	½	IR-23	BTS-3.3Meg	
R6	220Ω	½	IR-114	BTS-220	
R7	2.2Meg	½	IR-13	BTS-2.2Meg	
R8	470KΩ	½	IR-11	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRAV-LER PART No.	IRC PART No.	
R9	47KΩ	½	IR-10	BTS-47K	
R10	470KΩ	½	IR-11	BTS-470K	
R11	1000Ω	1	IR-42	BTA-1000	
R12	220Ω	½	IR-114	BTS-220	
R13	33Ω	½	IR-17	BTS-33	
R14	220KΩ	½	IR-20	BTS-220K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3.4Ω	AT-14	Z1102	A3031	A3336	24S50A	S-16X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRAV-LER PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3.4Ω	SPK-38	4A1	304S2	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRAV-LER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1.7Ω		LL-39				
L2	Osc. Coil	.8Ω	6.3Ω	LO-21	14-1060	BC-387	71-OSC	
L3	Input IF	25Ω	25Ω	LI-13	16-6758	BC-352	12-C1	
L4	Output IF	25Ω	25Ω	LI-13	16-6758	BC-353	12-C2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	TRAV-LER PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1				46-T	0-1 or S-1 & 0-3	

ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

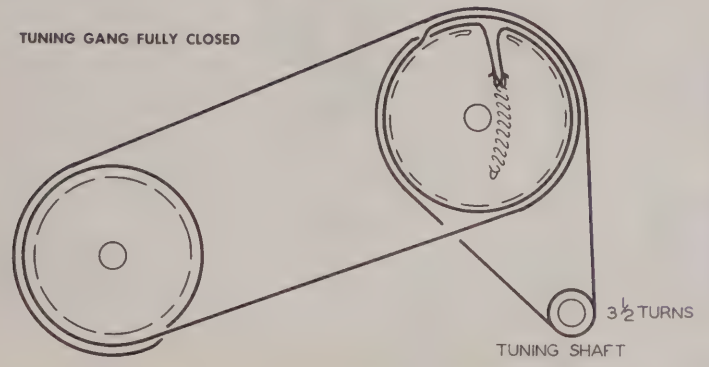
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	TRAV-LER PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		†CR-55 or ♦CR-55D and †CR-55LP or ♦CR-55LPD	†C-449 or ♦C-449D and †A-448 or ♦A-448D	†W-64S or ♦W-64D and †W-64MGS or ♦W-64MGD	†Jewel ♦Diamond

MISCELLANEOUS

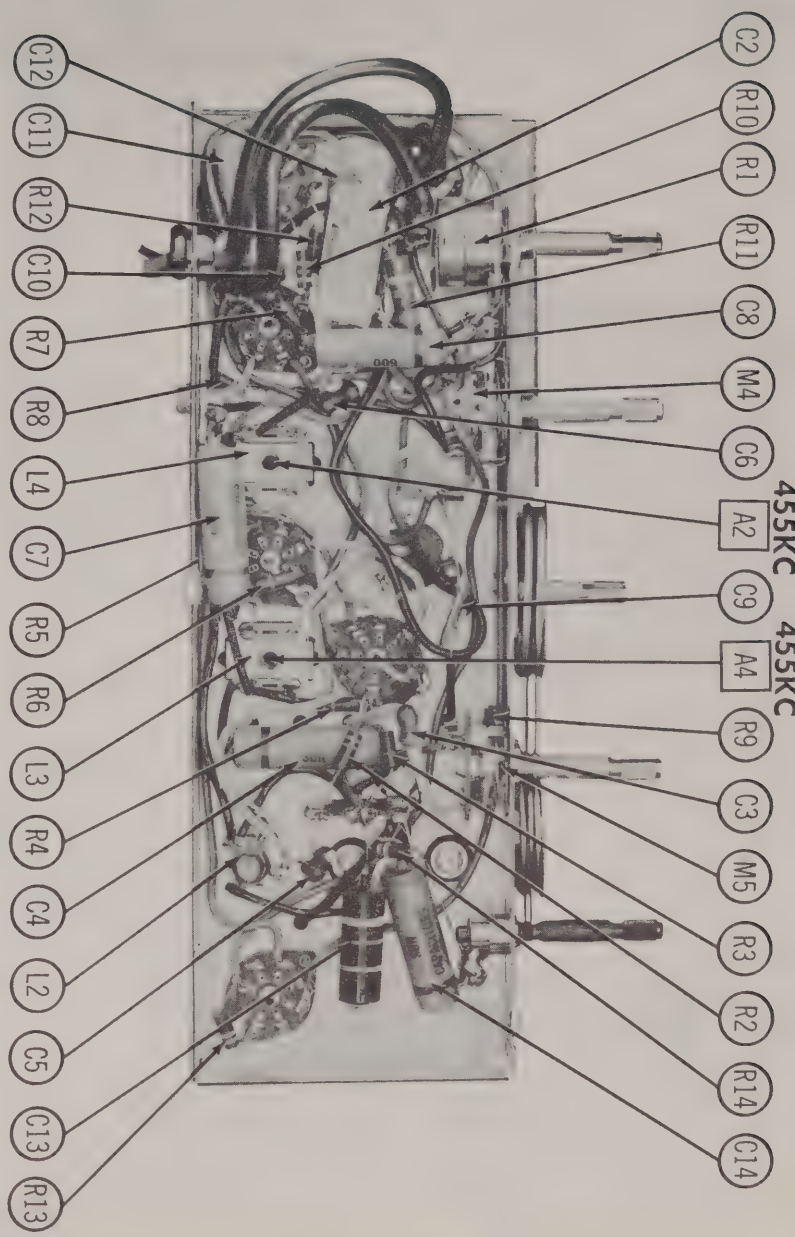
ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M3	Tuning Cap.	GC-16	2 Gang (28-385MMF, 28-175MMF)
M4	Switch	SW-1	Radio-phono (DPDT Rotary - wafer type)
M5	Switch	SW-2	Tone (SP-3 position rotary-wafer type)

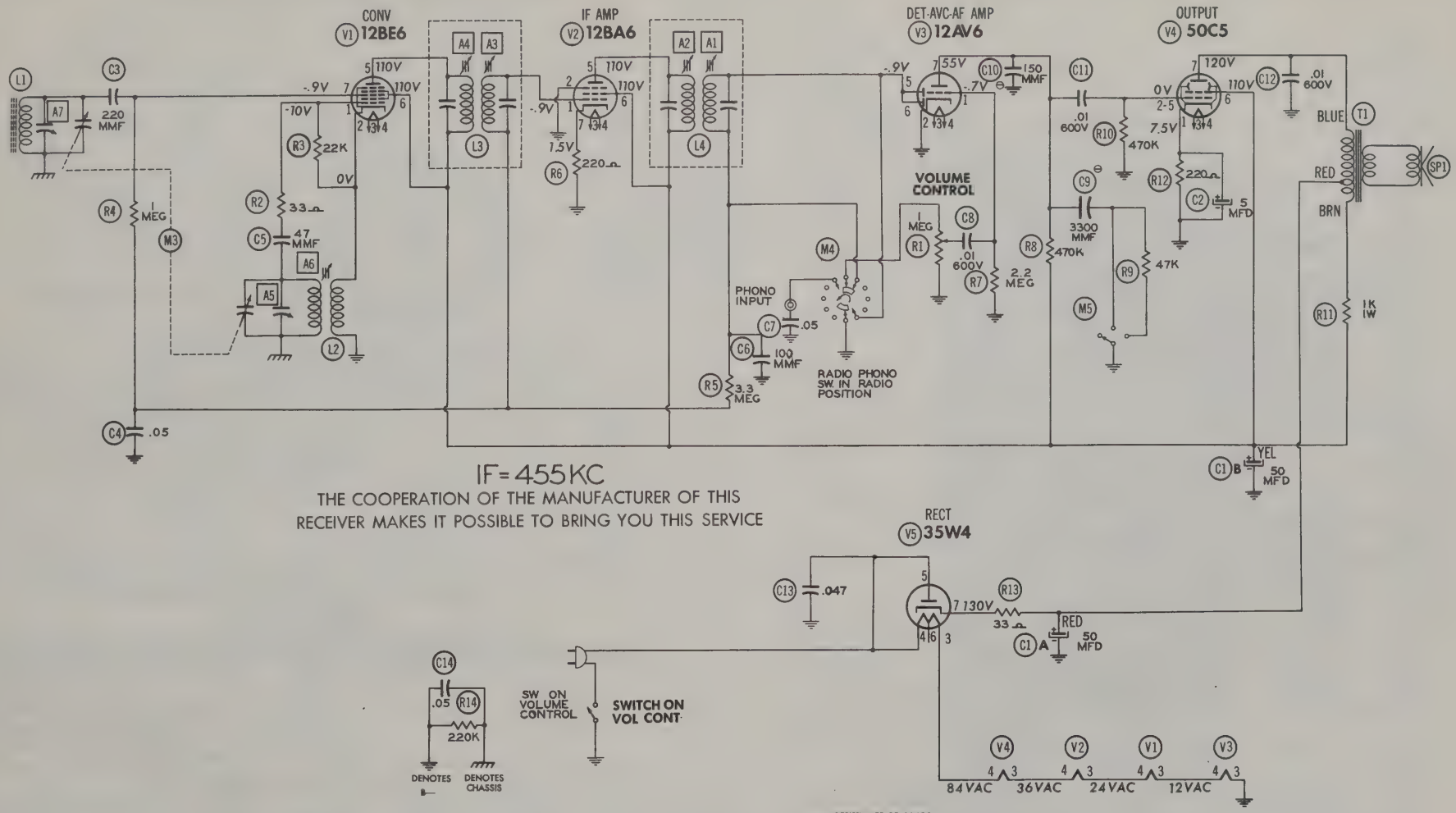


DIAL CORD STRINGING

PROPERTY OF
L. F. BLANKENSHIP
3000 MEADE ST.
DENVER, COLORADO

CHASSIS—BOTTOM VIEW





IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.7Ω	12Ω	24Ω	†1KΩ	†1KΩ	5.3Meg
V 2	12BA6	4.3Meg	0Ω	24Ω	36Ω	†1KΩ	†1KΩ	220Ω
V 3	12AV6	2.2Meg	0Ω	0Ω	12Ω	1Meg	1Meg	†47KΩ
V 4	50C5	220Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	†250Ω
V 5	35W4	TP	NC	86Ω	121Ω	121Ω	115Ω	100KΩ

ALL MEASUREMENTS TAKEN IN RADIO POSITION WITH PHONO MOTOR DISCONNECTED.
† MEASURED FROM PIN 7 OF V5.
TP - TIE POINT
NC - NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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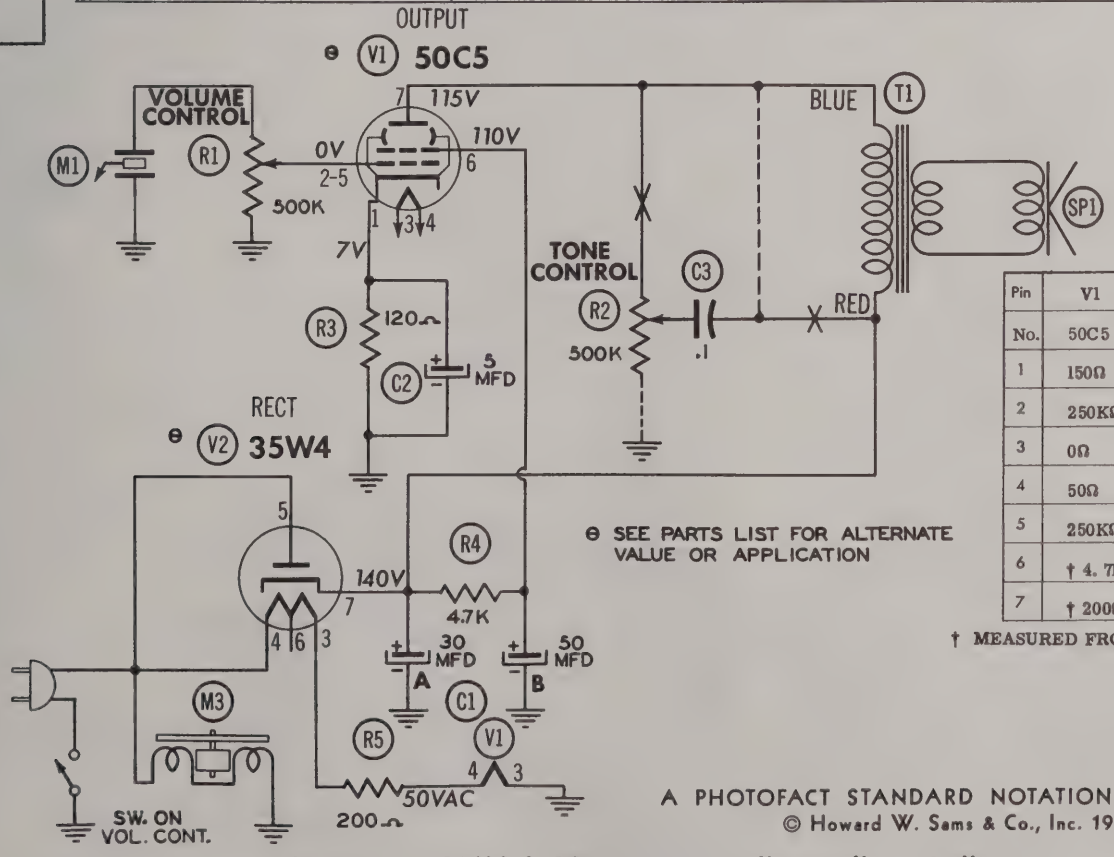
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Truetone Model D2471
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC Operated Phono Amplifier with 3 Speed Manual Record Player
TUBES (Two)	Types 50C5 (or) 50L6GT Output, 35W4 (or) 35Z5GT Output
POWER SUPPLY	105-125 Volts AC-60 Cycles
RATING	.18 Amp. @ 117 Volts AC



θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

Pin No.	V1 50C5	V2 35W4
1	150Ω	INF
2	250KΩ	INF
3	0Ω	200Ω
4	50Ω	235Ω
5	250KΩ	235Ω
6	† 4.7KΩ	220Ω
7	† 200Ω	200KΩ

† MEASURED FROM PIN 7 OF V2.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	Output	50C5	50C5	50L6 used in some versions.
V2	Rectifier	35W4	35W4	35Z5 used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	30	150	CE-5030WA	PRS150V5030	BBRD5315	TCD497	TDL-5030-150	MTD-301	TVA-2450
B	50	150							
C2	5	50	CE-5WA	PRS150V4	BR550	TC30	TD-5-50	MMT-0505	TVA-1303

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.1	400	CP.1WA	P488-1	DF-104	CUB4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	390062	B-60-S	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A.
R2A	500KΩ	½	390117	B-60	A47-500K-Z	Q13-133	U-48	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	120Ω	½	RC15IHWA	BTS-120	
R4	4700Ω	½	RC472HWA	BTS-4700	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R5	200Ω	10	RWW22W-10WA		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.3KΩ	3.2Ω	Part of spkr.	Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

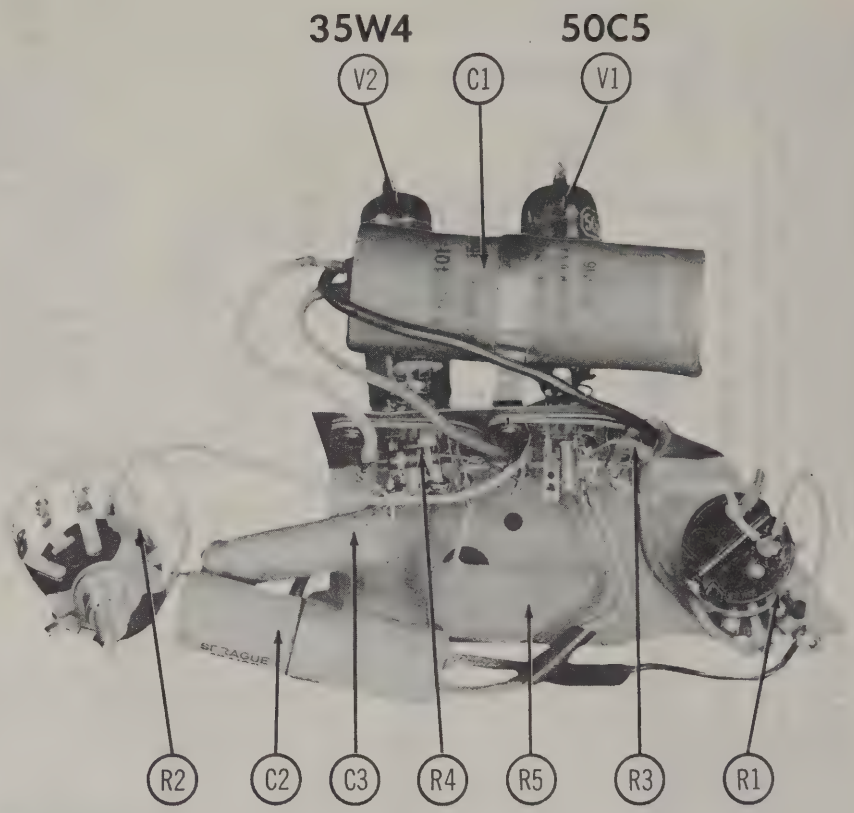
ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3.2Ω	LS4-WH	4A1	304S2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1	C10-WA	L-29 * P-29	2 mil conventional	60 * 2460	2 mil conventional	* Complete tone arm and cartridge assembly.

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2	N-2-WA	* J-152 or * J-752	* B-379	* W-14AGA	* Metal

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Motor	PM3-WA	Phono-Includes Turntable
	Cabinet	CB730-WA	Includes Motorboard
	Knob	KNVP-WA	On-off-volume
	Knob	KNBTC-WA	Bass-Treble

PHOTOFACT* Folder

*TRADE MARK

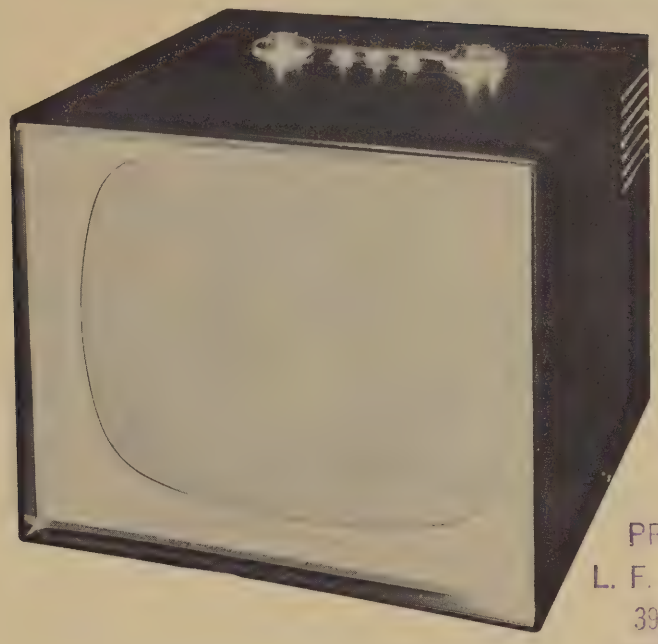
RETMA MEMBER

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

WESTINGHOUSE MODELS H-916T17A, H-916TU17A, H-919T17A, H-919TU17A, H-920T17A, H-920TU17A, H-921T17A, H-921TU17A, H-924T21A, C, H-924TU21C, H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C, H-965K21C, H-965KU21C, H-966K21C, H-966KU21C, H-974T21, H-974TU21, H-975T21, H-975TU21, H-976T21, H-976TU21, H-978T17, H-978TU17, H-979T17, H-979TU17, H-980T17, H-980TU17 (Ch. V-2340-25, V-2341-15, -25, -35, -41, -45, V-2350-204, V-2351-204, -304, -404)



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE MODEL H-927T21C (Ch. V-2341-45)

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H-916T17A, H-919T17A, H-920T17A, H-921T17A, H-978T17, H-979T17, H-980T17	V-2340-15, -25, -104
		H-924T21A, H-924T21C, H-927T21C, H-928T21C, H-929T21C, H-965K21C, H-966K21C, H-974T21, H-975T21, H-976T21	V-2341-15, -25, -35, -41, -45
		H-916TU17A, H-919TU17A, H-920TU17A, H-921TU17A, H-978TU17, H-979TU17, H-980TU17	V-2350-204
		H-924TU21C, H-927TU21C, H-928TU21C, H-929TU21C, H-965KU21C, H-966KU21C, H-974TU21, H-975TU21, H-976TU21	V-2351, -104, -204, -304, -404
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Div., Metuchen, N.J.		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

INDEX

Alignment Instructions 6

Disassembly Instructions 1

Horizontal Sweep Circuit Adjustments 16

Parts List and Descriptions 12,13,14

Photographs
- Capacitor & Alignment Identification (Printed Circuit Sub-chassis) . . 10
- Chassis-Bottom View (Horiz. Chassis) 3
- Chassis-Rear View (Vert. Chassis) 7
- Chassis-Rear View 16
- RF Tuner 15

Photographs (Cont)
- Resistor & Inductor Identification (Printed Circuit Sub-chassis) 11

Resistance Measurements 8

Servicing in the Field 1

Schematic (Alternate Tuners) 4, 9

Schematic (TV) 2

Tube Failure Check Chart 5

Tube Placement Chart (Bottom View) 8

Tube Placement Chart (Top View) 5

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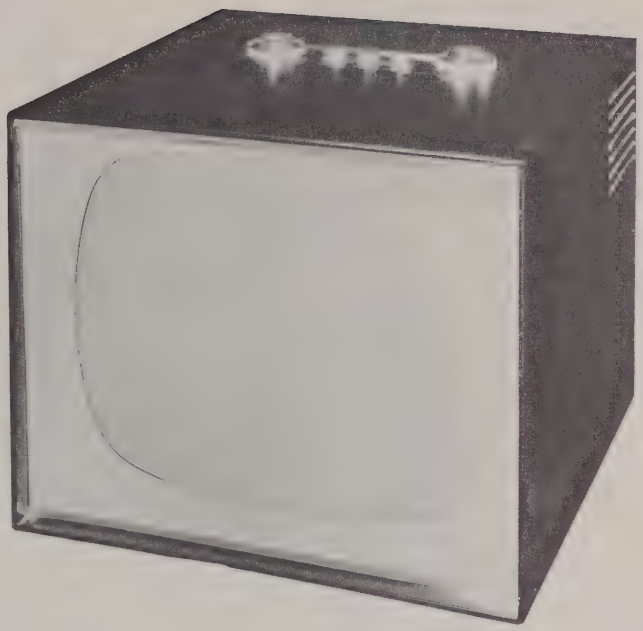
RETMA MEMBER

WESTINGHOUSE MODELS H-916T17A, H-916TU17A, H-919T17A, H-919TU17A, H-920T17A, H-920TU17A, H-921T17A, H-921TU17A, H-924T21A, C, H-924TU21C, H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C, H-965K21C, H-965KU21C, H-966K21C, H-966KU21C, H-974T21, H-974TU21, H-975T21, H-975TU21, H-976T21, H-976TU21, H-978T17, H-978TU17, H-979T17, H-979TU17, H-980T17, H-980TU17 (Ch. V-2340-25, V-2341-15, -25, -35, -41, -45, V-2350-204, V-2351-204, -304, -404)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from top panel of cabinet.
2. Remove 8 metal screws. Remove rear cover.
3. Disconnect speaker leads and remove speaker lead clamp.
4. Remove 6 chassis bolts. Remove chassis.
5. Remove 2 speaker nuts. Remove speaker.



CHASSIS
V-2340-15, -25, -104, V-2341-15, -25, -35, -41, -45, V-2350-204, V-2351, -104, -204, -304, -404

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SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 3 metal screws holding metal strip at the top edge of the safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS - Sync Control Adjustment

Tune in the strongest available TV station. Turn sync control (R7) clockwise until the picture begins to show signs of overload or if signal is weak, snow becomes more pronounced. Turn the control counter clockwise until the snow is at minimum or evidence of overload disappears.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of horizontal oscillator it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of the chassis.
Set the horizontal hold control (R2) at the center of its range and adjust the horizontal frequency slug (B2) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the quieting control (R8) located on the rear apron of chassis for maximum sound and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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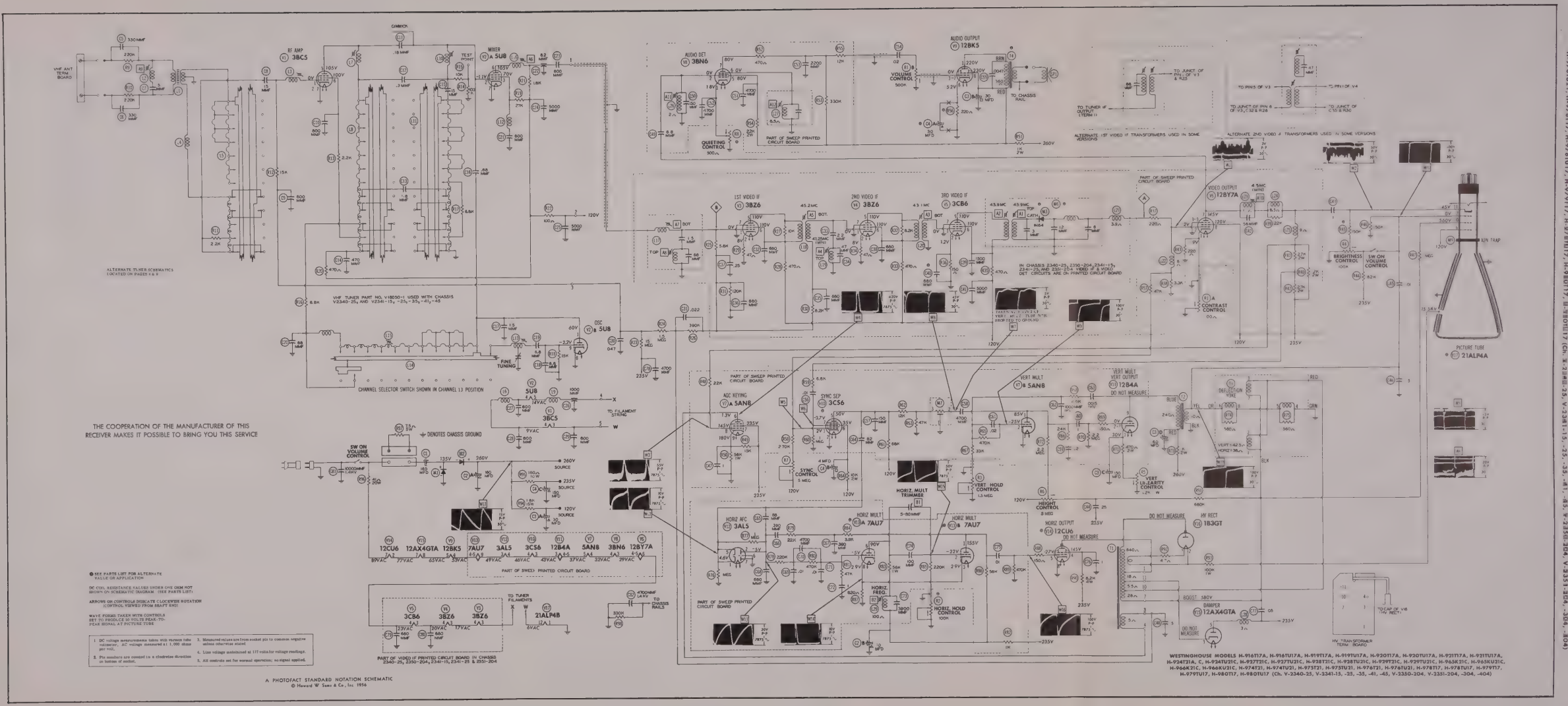
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1956
WESTINGHOUSE MODELS H-916T17A, H-916TU17A, H-919TU17A, H-920TU17A, H-921TU17A, H-921TU17A, H-924T21A, C, H-924TU21C, H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C, H-965K31C, H-965KU31C, H-966K21C, H-966KU31C, H-974T21, H-974TU21, H-975T21, H-975TU21, H-976T21, H-976TU21, H-977T17, H-977TU17, H-980T17, H-980TU17 (Ch. V-2340-25, V-2341-15, -25, -35, -41, -45, V-2350-204, V-2351-204, -304, -404)

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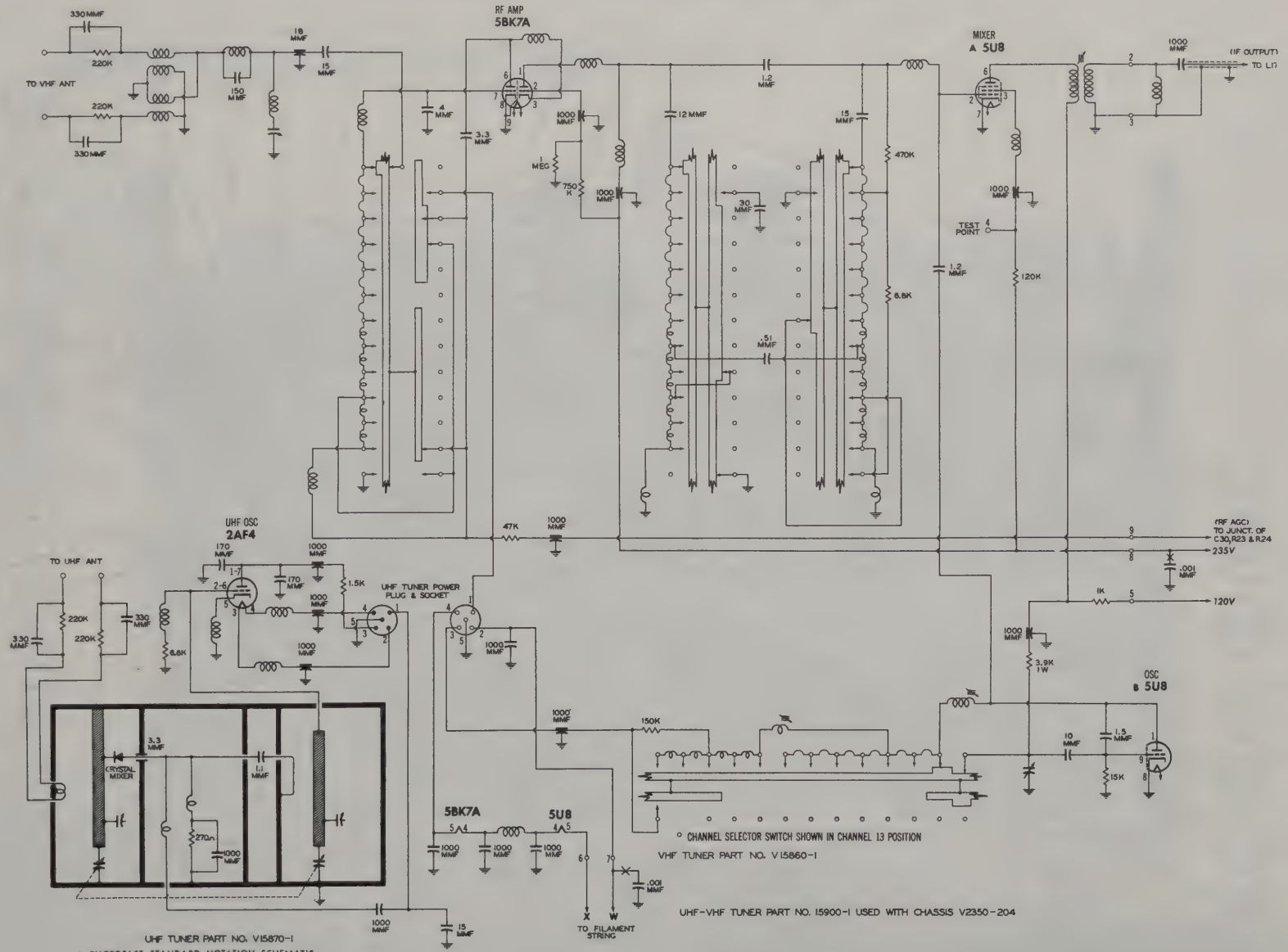
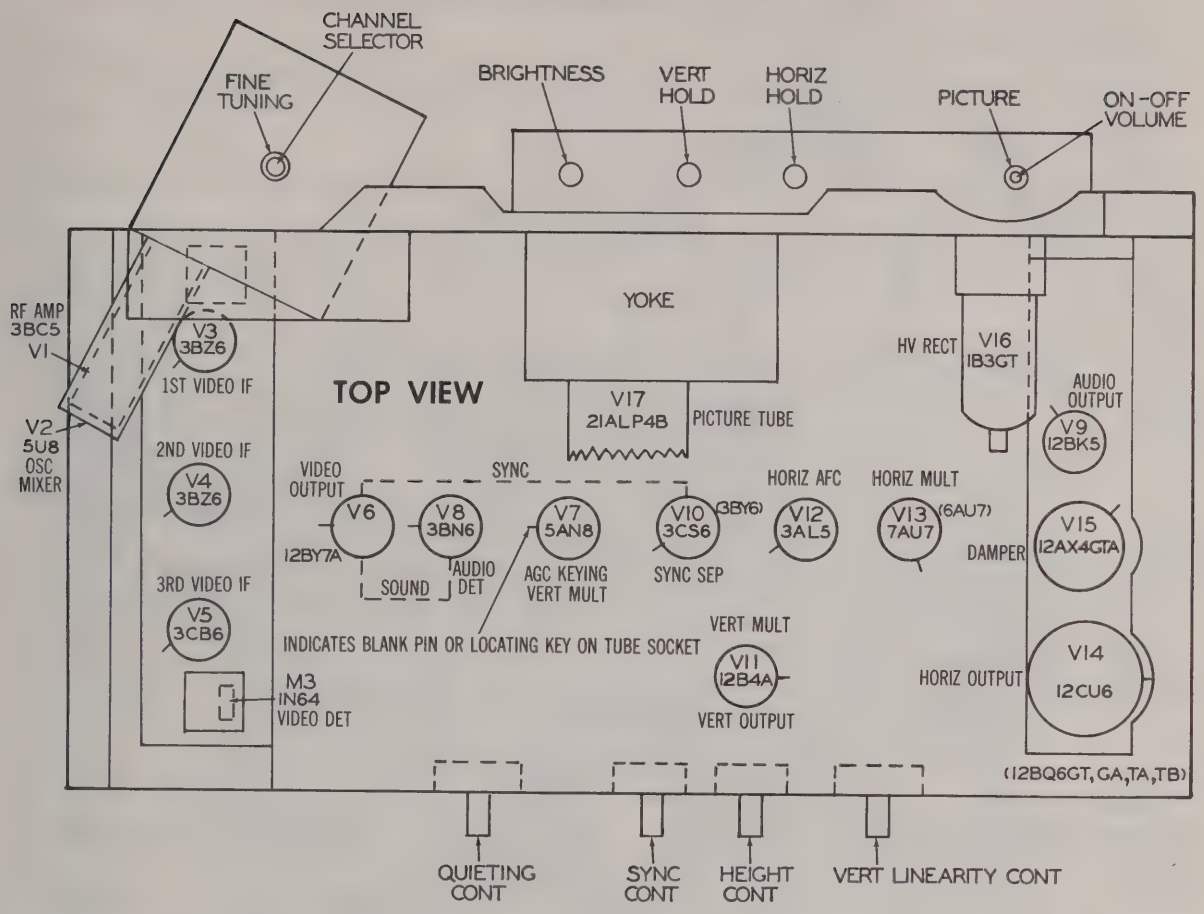
HORIZONTAL CHASSIS BOTTOM VIEW

WESTINGHOUSE MODELS H-916T17A, H-916TU17A, H-919T17A, H-919TU17A, H-920T17A, H-920TU17A, H-921T17A, H-921TU17A, H-924T21A, C, H-924TU21C, H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C, H-965K21C, H-965KU21C, H-966K21C, H-966KU21C, H-974T21, H-974TU21, H-975T21, H-975TU21, H-976T21, H-976TU21, H-978T17, H-978TU17, H-979T17, H-979TU17, H-980T17, H-980TU17 (Ch. V-2340-25, V-2341-15, -25, -35, -41, -45, V-2350-204, V-2351-204, -304, -404)



ALTERNATE UHF-VHF TUNER SCHEMATIC

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V7, V17**
Has pic, no sound - **V8, V9**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V7, V10, V11**
No horiz. sync - **V10, V12, V13**
No vert. or horiz. sync - **V10**

SWEEP FAILURE
No raster, has sound - **V13, V14, V15, V16, V17**
No vertical deflection - **V7, V11**
Poor vert. linearity or foldover - **V7, V11**
Poor horiz. linearity or foldover - **V13, V14, V15**
Narrow picture - **V13, V14, V15, V16, M1, M2**
Vert. off freq. - **V7, V10, V11**
Horiz. off freq. - **V10, V12, V13**

NOTE: Since this receiver employs tubes used in series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative (See circuit below).

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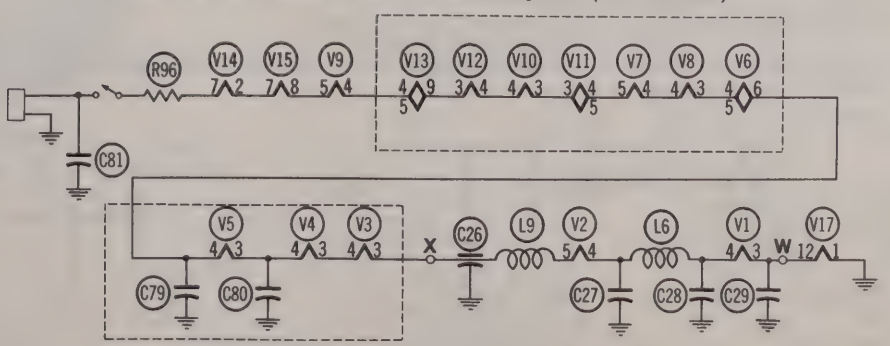


SET 311 FOLDER 18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect negative lead of a 3 volt bias supply to ungrounded side of C37. Positive to chassis. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD Capacitor	High side thru .001MFD to point (B). Low side to chassis.	Not used	43.9MC	Any non-interfering channel	Use VTVM. DC probe to point (A). Common to chassis.	A1, A2	Adjust A1 first then A2 for maximum deflection.
2.	"	"	"	43.1MC	"	"	A3	Adjust for maximum indication.
3.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM indication.
4.	"	"	"	45.2MC	"	"	A5	Adjust for maximum deflection.
5.	Fig. 2	Thru matching network (Fig. 2) across antenna terminals.	213MC (10MC Swp.)	41.25MC 42.25MC 43.0MC 45.0MC 45.75MC 47.25MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A6, A7, A8	Use high scope gain and only enough sweep generator output for useable pattern on scope. Clip high side of marker generator to converter (ungrounded) tube shield. Leave low side disconnected. Set fine tuning control to its mid-range position. Adjust A6 for correct overall bandpass (Fig. 1). Adjust A7 for correct tilt. Adjust A8 for MINIMUM marker amplitude at 41.25MC as in Fig. 1. If necessary, SLIGHTLY retouch A1, A2, A3 and A5 for symmetrical response similar to Fig. 1.

40-48MC TRAP ADJUSTMENT

The IF trap has been preset at the factory at approximately 44MC. It is for the purpose of eliminating any IF interference from nearby transmitters operating in the 40MC band. If interference is noted, turn to channel 2 and adjust the IF (A9) trap to minimize the interference.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD Capacitor	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any unused channel	DC probe thru detector (Fig. 3) to pin 11 (cathode) of picture tube.	A10	Use strong signal from generator. Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD Capacitor	High side to point (A). Low side to chassis.	4.5MC (15KC Swp.)	4.5MC	Any unused Channel	Vert. Amp. across volume control (R1B). Low side to chassis.	A12	Use strong signal from generator. Adjust A12 for maximum response at 4.5MC.
8.	"	"	"	"	"	"	A11, A12	Attenuate generator to give MINIMUM useful indication on scope. Adjust A11 and A12 for maximum output.
9.	"	"	Not used	4.5MC (30% 400~ Mod.)	"	"	R8	Starting with a very low signal input gradually increase the level, at the same time turning the quieting control (R8) back and forth until the signal level reaches the point where the AM output reaches the point where the output on the scope dips to zero with a peak on each side. Set R8 for zero output at this level.

SOUND IF ALIGNMENT USING A TV SIGNAL

Tune in a TV station and connect an attenuator between the antenna and receiver.
Set the quiting control (R8) to its mid-range position. Adjust the quadrature coil A12 for maximum sound. If two widely spaced peaks occur, use the one with the slug farthest counterclockwise. If two closely spaced peaks occur, either the signal is not strong enough or the quiting control is improperly set. Reduce the signal to its lowest usable level and adjust A11 and A12 for maximum sound. Apply a weak signal that allows noise to be heard in the speaker. Adjust the quiting control (R8) for minimum noise. The point of minimum noise depends on the strength of signal, therefore, the weakest possible signal should be used. Do not leave R8 at its maximum counterclockwise position.

ALIGNMENT FOR TUNER V-15560-1

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

ALIGNMENT FOR TUNER V-15900-1 (UHF-VHF)

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

OSCILLATOR ALIGNMENT FOR TUNER V-16050-1

Replacement of the 5U8 mixer oscillator tube may change the oscillator frequency enough to necessitate realignment of the oscillator. The slugs can be adjusted from the top of the cabinet with a nonmetallic alignment tool.
(1) Set the fine tuning to its midrange position. Keep it in this position during alignments.
(2) Set the channel selector to the highest high-band (7-13) channels operating in your area.
(3) Adjust the high-band adjustment slug (A13) for best picture detail and sound.
(4) Set the channel selector to the highest low-band (2-6) channel operating in your area.
(5) Adjust the low-band slug (A14) for best sound and picture detail.
(6) Check the previously made high band adjustment, if tuning has changed repeat the procedure.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver is not recommended in this field.

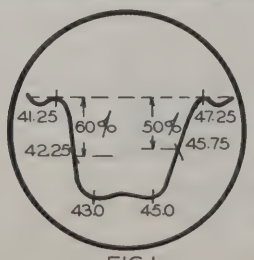
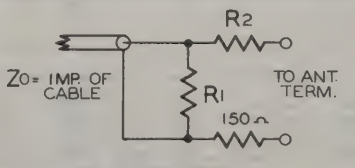


FIG. 1



Z0	R1	R2
50	56	120
75	82	110

FIG. 2

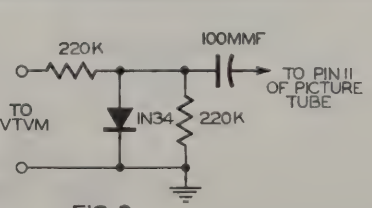
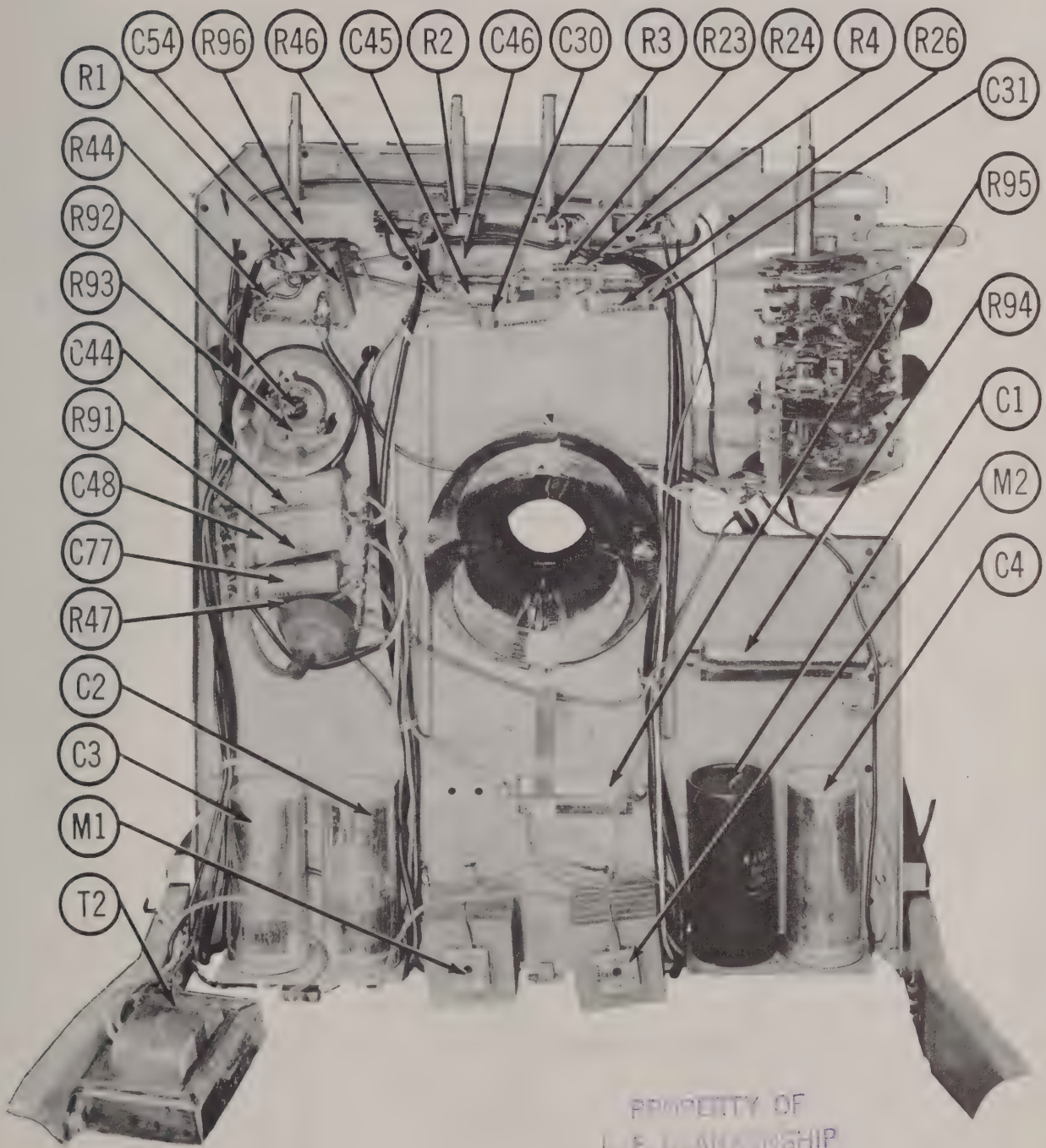


FIG. 3



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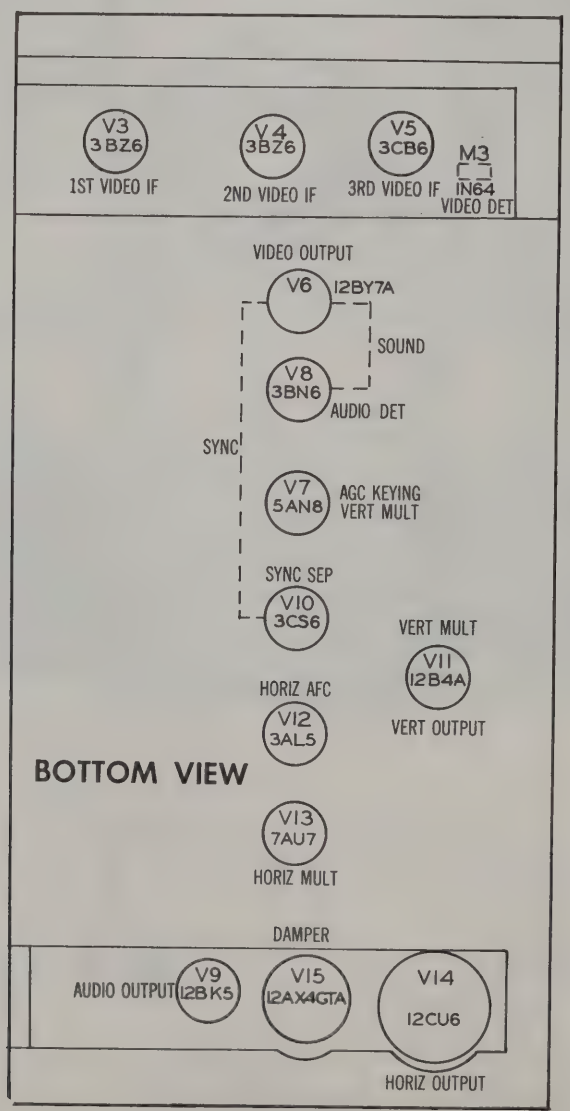
VERTICAL CHASSIS REAR VIEW

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	3BC5	1. 7Meg	0Ω	2Ω	3Ω	† 2. 4KΩ	† 4. 6KΩ	0Ω		
V 2	5U8	† 9. 2KΩ	110KΩ	† 30KΩ	3Ω	4Ω	†3. 7KΩ	0Ω	0 Ω	15KΩ
V 3	3BZ6	125KΩ	47Ω	4Ω	5Ω	† 2. 3KΩ	† 2. 3KΩ	0Ω		
V 4	3BZ6	130KΩ	47Ω	5Ω	6Ω	† 2. 3KΩ	† 2. 3KΩ	0Ω		
V 5	3CB6	. 1Ω	150Ω	6Ω	7Ω	† 2. 3KΩ	† 2. 3KΩ	0Ω		
V 6	12BY7A	30Ω	3. 3KΩ	0Ω	8Ω	8Ω	7Ω	† 3. 7KΩ	† 1. 8KΩ	0Ω
V 7	5AN8	▲ 4Meg	700KΩ	0Ω	9Ω	10Ω	500KΩ	† 180Ω	† 26KΩ	† 15KΩ
V 8	3BN6	250Ω	1. 2Ω	8Ω	9Ω	† 23KΩ	6. 5Ω	† 330KΩ		
V 9	12BK5	† 1. 3KΩ	NC	50KΩ	14Ω	16Ω	220Ω	50KΩ	† 1KΩ	TP
V 10	3CS6	40KΩ	0Ω	11Ω	12Ω	† 35KΩ	† 12KΩ	1Meg		
V 11	12B4A	1KΩ	2. 2Meg	11Ω	10Ω	10Ω	TP	2. 2Meg	NC	† 1. 3KΩ
V 12	3AL5	1Meg	2Meg	13Ω	12Ω	1Meg	0Ω	0Ω		
V 13	7AU7	† 60KΩ	280KΩ	820Ω	14Ω	14Ω	† 60KΩ	2. 5Meg	820Ω	13Ω
V 14	12CU6	NC	18Ω	TP	† 8. 4KΩ	470KΩ	NC	20Ω	0Ω	TOP CAP ▲ 18Ω
V 15	12AX4GTA	NC	NC	5Meg	NC	† 185Ω	NC	18Ω	16Ω	
V 16	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 658Ω
V 17	21ALP4B	0Ω	150KΩ	PIN 6 † 1. 8KΩ	PIN 10 ▲ 1Meg	PIN 11 † 200KΩ	PIN 12 2Ω			

† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 3 OF V15.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART

ALTERNATE VHF TUNER SCHEMATIC

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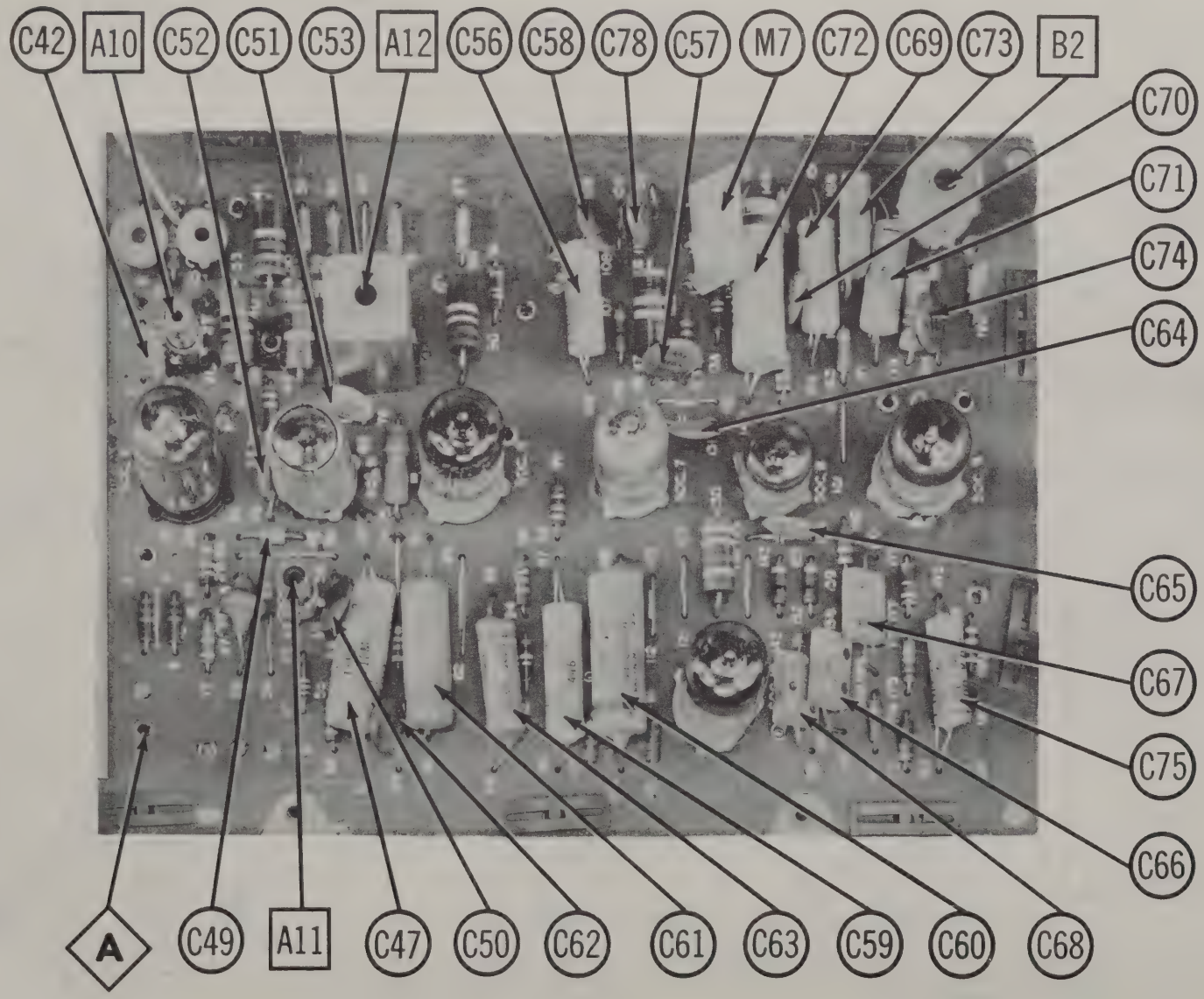

PRINTED CIRCUIT SUB-CHASSIS CAPACITOR & ALIGNMENT IDENT.

PRINTED CIRCUIT SUB-CHASSIS RESISTOR & INDUCTOR IDENT.

WESTINGHOUSE MODELS H-916T17A, H-916TU17A, H-919T17A, H-919TU17A, H-920T17A, H-920TU17A, H-921T17A, H-921TU17A, H-924T21A, C, H-924TU21C, H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C, H-965K21C, H-965KU21C, H-966K21C, H-966KU21C, H-974T21, H-974TU21, H-975T21, H-975TU21, H-976T21, H-976TU21, H-978T17, H-978TU17, H-979T17, H-979TU17, H-980T17, H-980TU17 (Ch. V-2340-25, V-2341-15, -25, -35, -41, -45, V-2350-204, V-2351-204, -304, -404)

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amp.	3BC5	3BC5	
V2	Mixer-Oscillator	5U8	5U8	
V3	1st Video IF Amp.	3BZ6	3BZ6	
V4	2nd Video IF Amp.	3BZ6	3BZ6	
V5	3rd Video IF Amp.	3CB6	3CB6	
V6	Video Output	12BY7A	12BY7A	
V7	AGC Keying-Vert. Mult.	5AN8	5AN8	
V8	Audio Det.	3BN6	3BN6	
V9	Audio Output	12BK5	12BK5	
V10	Sync. Sep.	3C96	3C96	3BY6 used in some versions.
V11	Vert. Mult.-Vert. Output	12BA4	12BA4	
V12	Horiz. AFC	3AL5	3AL5	
V13	Horiz. Mult.	7AU7	7AU7	6AU7, 6AU7A used in some versions.
V14	Horiz. Output	12CU5	12BQ6GT, GA, GTA, GTB used in some versions.	
V15	Damper	12AX4GTA	12AX4GTA	
V16	R.V. Rect.	1B3GT	1B3GT	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: Westinghouse PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	NOTES
V17	21ALP4B ①	21ALP4A / S ①	21ALP4A	21ALP4A, ① Aluminized ② ② Silver screen "85"	
		21ALP4C ①	21ALP4A ①	21ALP4 ②	
		21ALP4	21ALP4	21ALP4 ③	
	17AYP4A / 17AYP4A ①			17AYP4 ④	
				17AVP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1	150	200	V-15328-1	AVH-37-3S	DO27	FP151	TM-150-200	S-150	TVL-1540	
C2A	a .160	350	V-15328-1	B48398			TM-3032	D-177	R2134	
B	a .10	350						FM-3512		
C3A	a 30	300	V-15327-1	AFH4-56-30	C150	FP430.3	TM-604020-350	Q-220	R2133	
B	a 30	300			CBR35015		TD-150-50			
C	150	50								
D	a 60	300								
C4A	a 30	50	V-15328-1 (Note 1)	E4C849			TM-3128		R-2132	
B	a 4	150							MT-4504	
C	a 150	350								

Note 1. Used only in chassis V-2341-35, V-2341-45, V-2351-304, and V-2351-404.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	330	500	21SY023A31	5I330	D6-331	5WS733	GP2K-331	UC-5333	1FM-333	
C6	330	500	21SY023A31	5I330	D6-331	5WS733	GP2K-331	UC-5333	1FM-333	
C7	5.1									
C8	15			NPO-5I15	TC2-15	TZ1I	NPOK-150		5TCC-Q15	
C9	800			BPD-0008	DD-801	KD67	83I-801	DC-531	5GA-T8	
C10	800			BPD-0008	DD-801	KD67	83I-801	DC-531	5GA-T8	
C11	18									
C12	3									
C13	1.8									
C14	470			5I470	DD-471	TP46	GP2K-471	UC-5347	5GA-V47	
C15	15			BPD-000015	DD-150	G0I1	83I-150	UC-5316	5GA-Q15	
C16	.68				TC2-R68	TZ0I	NPOA-0R68			
C17	1.5									
C18	5.8									
C19	5.8									
C20	.98				TC2-R68	TZ0I	NPOA-0R98			
C21	800			BPD-0008	DD-801	KD67	83I-801	DC-531	5GA-T8	
C22	83									
C23	800			BPD-0008	DD-801	KD67	83I-801	DC-531	5GA-T8	
C24	5000			BPD-005	DD-502	KD80	81I-005	DC-525	5HK-D5	
C25	5000			BPD-005	DD-502	KD80	81I-005	DC-525	5HK-D5	
C26	1000			EF-001	MFT-1000				5O3C-D1	
C27	800			BPD-0008	DD-801	KD67	83I-801	DC-531	5GA-T8	
C28	800			BPD-0008	DD-801	KD67	83I-801	DC-531	5GA-T8	
C29	800			BPD-0008	DD-801	KD67	83I-801	DC-531	5GA-T8	
C30	.047	400	21DY014A73	BPD-05	DD-503	CUP4B47		PT4I7	4TM-S47	
C31	.022	600	21DY062A22	BPD-03	DD-303	CUB6S3	8I7-03	PT6I2	6TM-S22	
C32	680		21SY118A81	BPD-0008	DD-681	KD65	8I1-681	UC-5368	5GA-T68	
C33	2.2		21TY012A39	NPO-2I2.2	TC2-2R2	TZ05	NPOA-2R2		5TCCB-V22	
C34	47		RICC23C0G470K	NPO-5I47	TC2-47	TZ33	NPO-338-470	27-5447	5TCC-Q47	
C35	680		21SY118A81	BPD-0008	DD-681	KD65	8I1-681	UC-5368	5GA-T68	
C36	680		21SY118A81	BPD-0008	DD-681	KD65	8I1-681	UC-5368	5GA-T68	
C37	.25	400	21DY012A54	P488N-25		CUB4P25		PT4I5	4TM-P25	
C38	680		21SY118A81	BPD-0008	DD-681	KD65	8I1-681	UC-5368	5GA-T68	
C39	1500		V-10710-12	BPD-0015	DD-152	KD71	801-0015	DC-5215	5HK-D15	
C40	680		21SY118A81	BPD-0008	DD-681	KD65	8I1-681	UC-5368	5GA-T68	Note 2
C41	5000		21SY114A73	BPD-005	DD-502	KD80	81I-005	DC-525	5HK-D5	
C42	56		21SY01AA60							
C43	1	400	21DY01AA04	P488N-1	DF-104	CUB4P1		PT4I1	4TM-P1	
C44	.25	400	21DY012A54	P488N-25		CUB4P25		PT4I5	4TM-P25	
C45	.01	600	21DY062A03	BPD-01	DD-103	CUB6I3	GP3-333-103	PT6I1	6TM-S1	
C46	.15	400	21DY01AA54	P488N-15		CUB4P15		PT4I5	4TM-P15	
C47	.1	400	21DY01AA04	P488N-1	DF-104	CUB4P1		PT4I1	4TM-P1	
C48	.5	400	21DY04AA74	P488N-5		CUB4P5		PT405	4TM-P5	
C49	8.8		21TY028A88	NPO-5I8.8	TC2-5R8	TZ08	NPOA-6R8	ZT-5568	5TCCB-V68	
C50	150		21SY01AA51							
C51	4700		R2CC82Y5Y472M	BPD-0047	DD-472	KD79	8I1-0047	DC-525	5HK-D47	
C52	4700		R2CC82Y5Y472M	BPD-0047	DD-472	KD79	8I1-0047	DC-525	5HK-D47	
C53	2200		21SY062A22	BPD-0022	DD-223	KD73	8I1-0022	DC-5222	5HK-D22	
C54	.02	600	21DY062A22	BPD-02	DD-203	CUB6S2	8I7-02	PT6I2	6TM-S2	
C55	.0047	600	21DY084A72	BPD-0047	DD-472	CUB6047	GP3-333-472	PT6I47	6TM-D47	
C56	.01	600	21DY061A03	BPD-01	DE-103	CUB6I1	GP3-333-103	PT6I1	6TM-S1	
C57	150		21SY01AA51							
C58	4700		R2CC82Y5Y472M	BPD-0047	DD-472	KD79	8I1-0047	DC-525	5HK-D47	
C59	.02	600	RCP10ME203K	BPD-02	DD-203	CUB6S2	8I7-02	PT6I2	6TM-S2	
C60	.1	400	21DY01AA04	P488N-1	DF-104	CUB4P1		PT4I1	4TM-P1	
C61	.02	600	21DY062A22	BPD-02	DD-203	CUB6S2	8I7-02	PT6I2	6TM-S2	
C62	1000	1000	21SY01AG2	HVD-15-001	DD-102	VD1	1R5KV-102	DC3021	10GA-D1	
C63	.0015	1000	21DY01AA52	HVD-15-152	DD-152	CUB6D15	1R5KV-152	DC3025	10GA-D15	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C64	82									
C65	68		21SY018A80							
C66	390	500	21SY013A91	1489-00039	D6-391	5R5739	81I-391	MCB343	MS-339	
C67	390	500	21SY013A91	1489-00039	D6-391	5R5739	81I-391	MCB343	MS-339	
C68	680	500	21SY018A81	1464-00088	D6-681	1R5768	81I-681		MS-368	
C69	.01	600	21DY061A03	BPD-01	DD-103	CUB6I1	GP3-333-103	PT6I1	6TM-S1	
C70	4700		R3CC62Y5Y472M	BPD-0047	DD-472	KD79	8I1-0047	DC-525	5HK-D47	
C71	.01	600	21DY061A03	BPD-01	DE-103	CUB6I1	GP3-333-103	PT6I1	6TM-S1	
C72	.1	400	21DY01AA04	P488N-1	DF-104	CUB4P1		PT4I1	4TM-P1	
C73	3200	500	21SY103A92	1484-00039		1R5D39		MCB483	MS-339	
C74	100		21SY01AA01							
C75	.01	600	21DY061A3	BPD-01	D6-103	CUB6I1	GP3-333-103	PT6I1	6TM-S1	
C76	.1	400	21DY01AA04	P488N-1	DF-104	CUB4P1		PT4I1	4TM-P1	
C77	.05	600	21DY024A73	BPD-05	DF-503	CUB6I5		PT6I5	6TM-S5	
C78	4700		R2CC62Y5Y472M	BPD-0047	DD-472	KD79	8I1-0047	DC-525	5HK-D47	
C79	680		21SY118A81	BPD-0008	DD-681	KD65	8I1-681	UC-5368	5GA-T68	
C80	680		21SY118A81	BPD-0008	DD-681	KD65	8I1-681	UC-5368	5GA-T68	
C81	10000	1400	V-10710-13	DAC-37	DD-103					
C82	4700	1400	21SY300M01	BPD-0047	DD-502	VD47	1R5KV-472		30HK-D5	

Note 2. Chassis V-2340-15, V-2340-25, V-2350-104, V2350-204, V-2341-15, V-2341-25, V-2351-104 and V-2351-204 use 1500MMF in the application (Part No. V-10710-12).

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	100Ω	1	V-10021-3			UE44S		Contrast (Panel)
B	500KΩ							Volume & Switch (Rear)
R2A	100KΩ	1	V-15315-3	B-40	A47-100K-S	Q11-129	TA15L	Horiz. Hold -See Note 1
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R2A	80KΩ	1	V-15315-2	B-35	A47-75K-S	Q11-125	TA54L	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	1.5Meg	1	V-15315-4	AB-742	A47-500-S	Q11-153	U-155	Vert. Hold
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R3A.
R4A	100KΩ	1	V-15315-3	B-40	A47-100K-S	Q11-129	TA15L	Brightness
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R4A.
R5A	1200Ω	1	V-14782-3	AB-5	37C1-1000-S			Vert. Linearity
B	Shaft		Not Req.	AK-1	Not Req.			Attach to R5A.
R6A	5Meg	1	V-12709-11	AB-87	A47-5Meg-S	Q11-141	TA58L	Height
B	Shaft		Not Req.	AK-1	Not Req.	Not Req.	Not Req.	Attach to R6A.
R7A	5Meg	1	V-12709-11	AB-87	A47-5Meg-S	Q11-141	TA58L	Sync
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R7A.
R8A	500Ω	1	V-12709K-12	AB-4	A47-500-S	Q11-103	TA2S2L	Quieting-See Note 2
B	Shaft		Not Req.	AK-1	FKS-1	RQ	Not Req.	Attach to R8A.

Note 1. Some versions may use an alternate control Part No. V-15315-2.
Note 2. Some versions may use an alternate control Part No. V-15708-16.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R9	220KΩ	1	250V223A24	BTS-220K	
R10	220KΩ		250V223A24	BTS-220K	
R11	220Ω	1		BTS-2200	
R12	150Ω	1		BTS-15K	
R13	2200Ω	1		BTS-2200	
R14	100KΩ	1		BTS-100K	
R15	10KΩ	1		BTS-10K	
R16	6800Ω	1		BTS-6800	
R17	6800Ω	1		BTS-6800	
R18	15KΩ	1		BTS-15K	
R19	27KΩ	1		BTS-27K	
R20	470Ω	1		BTS-470	
R21	1800Ω	1		BTS-1800	
R22	100Ω	1		BTS-100	
R23	15Meg 5%	1	250V213A56	BTS-15Meg5%	
R24	1.5Meg 5%	1	250V213A55	BTS-1.5Meg5%	
R25	560Ω	1	V-9927-22	BTS-560	
R26	390KΩ	1	250V223A94	BTS-390K	
R27	10KΩ	1	V-9927-21		
R28	470Ω	1	250V234A71	BTS-470	
R29	47Ω	1	250V234A70	BTS-47	
R30	6800Ω	1	V-9927-21		
R31	120KΩ	1	250V223A34	BTS-120K	
R32	6800Ω	1	V-9927-21	BTS-6800	
R33	470Ω	1	250V234A71	BTS-470	
R34	47Ω	1	250V234A70	BTS-47	
R35	470Ω	1	250V234A71	BTS-470	
R36	180Ω	1	250V231A51	BTS-150	
R37	330Ω	1	250V232A21	BTS-330	
R38	33000Ω	1	250V233A32	BTS-3300	
R39	22KΩ	1	250V223A23	BTS-22K	
R40	12KΩ	2	250V431A52	BTS-12K	
R41	2700Ω	2	250V432A72	BTS-2700	
R42	2700Ω	3	250V432A72	BTS-2700	
R43	220Ω	1	250V222A21	BTS-220	
R44	82KΩ	1	250V228A23	BTS-82K	
R45	150KΩ	1	250V223A54	BTS-150K	Note 1
R46	150KΩ	1	250V223A54	BTS-150K	
R47	1Meg	1	250V231A05	BTS-1Meg	
R48	22KΩ	1	250V223A23	BTS-22K	
R49	15KΩ 5%	1	250V311A53	BTS-15K 5%	
R50	56KΩ 5%	1	250V231A58	BTA-56K 5%	
R51	1000Ω	2	250V431A02	BTB-1000	
R52	47KΩ	1	250V234A71	BTS-470	
R53	330KΩ	1	250V223A34	BTS-330K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R54	22KΩ	2	250V223A23	BTB-22K	
R55	12KΩ	1	250V231A23	BTS-12K	
R56	220Ω	1		BTS-220	
R57	47KΩ	1	250V224A73	BTS-47K	
R58	270KΩ	1	250V223A74	BTS-270K	
R59	6800Ω	1	250V234A82	BTS-6800	
R60	1Meg	1	250V231A05	BTS-1Meg	
R61	68KΩ	1	250V223A83	BTS-68K	
R62	12KΩ	1	250V231A23	BTS-12K	
R63	47KΩ	1	250V224A73	BTS-47K	
R64	10KΩ	2	250V431A03	BTB-10K	
R65	470KΩ	1	250V224A74	BTS-470K	
R66	24KΩ 5%	1	250V312A43	BTS-24K 5%	
R67	33KΩ	1	250V223A33	BTS-33K	
R68	100KΩ	1	250V221A04	BTS-100K	
R69	150Ω	1	250V231A51	BTS-150	
R70	2.5Meg	1	250V225A25	BTS-2.5Meg	
R71	470Ω	2	250V424A71	BTB-470	
R72	2.5Meg	1	250V225A25	BTS-2.5Meg	
R73	1000Ω	1	250V431A03	BTB-1000	
R74	560Ω	1	250V225A56		
R75	560Ω	1	250V225A56		
R76	1Meg	1	250V231A05		
R77	1Meg	1	250V231A05		
R78	220Ω	1	250V222A24		
R79	22KΩ	1	250V222A23		
R80	470KΩ	1	250V224A74		
R81	47KΩ	1	250V224A73		
R82	1000Ω	1	250V221A02		
R83	56KΩ	1	250V233A83	BTA-56K	
R84	3900Ω	1	250V223A42		
R85	220KΩ 5%	1	250V312A24	BTS-220K 5%	
R86	56KΩ	1	250V225A53	BTS-56K	
R87	820Ω	1	250V233A21	BTS-820	
R88	150Ω	1	250V231A51		
R89	470Ω	1	250V224A74		
R90	82000Ω	4	V-12171-1	PW4-8200	
R91	680KΩ	1	250V226A84		
R92	4.7Ω	1	2S1V004A79	BW1-4.7	
R93	100KΩ	1	V-9927-18	BTA-100K	
R94	1800Ω	15	V-11328-21	3D-1750	
R95	180Ω	10	V-11328-22	1 3/4-W-200	
R96	43Ω	20	V-15608-1	2D-50	
R97	7.5Ω	5	V-15023-1		
R98	330K	1	250V233A34	BTS-330K	

Note 1. Some versions use a 220KΩ 1/2W resistor in this application (Mfgr. Part #250V223A24).
Note 2. Some versions use a 91Ω 1/2W 5% resistor in this application (Mfgr. Part #250V21BA10).

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	Halldorson PART No.	Merit PART No	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Horiz. Output Trans.	V-15650-2	FB420 ⑥ RF 800 * 1	HVD-54 * 1	X127 * 1	A-8235 * 1	FLY-76 * 1	D-49 * 1	
T2	Vert. Output Trans.	V-15325-5	Z1900 ②	A-2823		A-8142 1	26872 1	A-108X	
T3A	Yoke(90°) Horiz.(21MH)	V-15271-6 ③	DF807 ⑤	MDF-92	235DI	Y90P19/	DY-38A	Y-18	Y-41-1
B	Vert. (42MH)	⑤	⑤ ⑦	⑤ ⑦	⑤ ⑦	435 ⑤ ⑦	⑤ ⑦	⑤ ⑦	⑤ ⑦

① Drill new mounting hole(s).
② Use 8 to 1 turns ratio.
③ Alternate yoke Westinghouse Part #V-15271-1
④ Includes resistors R74 & R75.
⑤ Use original rear cover & centering device.
⑥ Use original yoke clamp & laminating ring.
⑦ Connect yoke term #3 to horiz. output trans. term #10. Connect yoke term #1 to horiz. output trans. term #7. Connect horiz. damping network across yoke terms #3 & #7.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
1	5	5	2	5	5	5	5
11	4	4	1	4	4	4	6
10	3	4	5	4	4	4	6
7	1	2	7	2	2	1	3
4	Term #1 of RF800	7	8	7	7	7	3
3	Term #2 of RF800	8	6	8	8	8	4
Connect Width (ad Arms	Terms #3 & #4 of RF800 Across 4 & 3						
Special Notes	⑤ ⑦	⑤	⑤	⑤	⑤	⑤	⑤

⑤ If insufficient width, add capacity (approx. 56-100MMF ② 6KV) across horiz. yoke.
⑦ If AGC does not function properly, reverse width coil primary to secondary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI	IMPEDANCE: SEC	REPLACEMENT DATA: Westinghouse PART No	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	7.5KΩ	3-4Ω	V14080G-5 V14080-4 ①	21115 ②	A2823 ②	A3850 ②	34882 ②	S-6X	① Used as alternate. ② Drill one new mounting hole.

SPEAKER

ITEM No	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: Westinghouse PART No	OUAM PART No	RCA TYPE No	NOTES
SP1	6"	PM	3-4Ω	V15597-1	5A07	20582	

COILS (RF-IF)

ITEM No.	USE	DC RES: PRI	DC RES: SEC	REPLACEMENT DATA: Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Trans.	.1Ω	.1ΩCT	V-8821-5				
L2	IF Trap	.1Ω		V-8887				
L3	Ant. Coil	0Ω						Channel 13
L4	Ant. Coil	0Ω						
L5	Ant. Coils	0Ω						
L6	Fil. Choke	0Ω						
L7	RF Coil	0Ω						Channel 13
L8	RF Coils	0Ω						
L9	Fil. Choke	0Ω						
L10	Mixer Grid Coil	0Ω						
L11	Mixer Grid Coils	0Ω						High channels
L12	Trap Coil	0Ω						
L13	Osc. Coil	0Ω						
L14	Osc. Coils	0Ω						Low channels
L15	Conv. Plate	.1Ω						
L16	Conv. Coil	0Ω						
L17	1st Video IF Coil	0Ω		V-10018-1				Includes Capa. and 41.25MC Trap
L18	2nd Video IF	.1Ω	.1Ω		17-4822	TV-120	6319	
L19	47.25MC Trap	0Ω						
L20	3rd Video IF	.1Ω	.1Ω		17-4823	TV-120	6319	
L21	Series Peaking Coil	3.9Ω		V-15796-1		TV-120	6318	100 Microhenries
L22	Shunt Peaking Coil	8Ω		V-15480-8		TV-120	6334	330 Microhenries
L23	4.5MC Trap	1.1Ω		V-15795-1				
L24	Series Peaking Coil	6.5Ω		V-15796-4		TV-120	6318	190 Microhenries
L25	Shunt Peaking Coil	9Ω		V-15795-7		TV-120	6318	330 Microhenries
L26	Sound IF	1.2Ω		V-15795-2				
L27	Quadrature Coil	6.5Ω		V-15792-1				
L29	RF Choke	3Ω		V-8099-3		TV-120	6306	3.3 Microhenries, UNC Part No. C1A

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI	DC RES: SEC	REPLACEMENT DATA: Westinghouse PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No	Ram PART No	Thordarson PART No	NOTES
L28	100Ω		V-15791-1							

PROPERTY OF L. F. [illegible] SHIP

WESTINGHOUSE MODELS H-916T17A, H-916TU17A, H-916TU17B, H-916TU17C, H-916TU17D, H-916TU17E, H-916TU17A, H-9201U17A, H-9201U17B, H-9211T17A, H-9211TU17A, H-9211TU17B, H-9211TU17C, H-9211TU17D, H-9211TU17E, H-9211TU17A, H-9241T17A, H-9241TU17A, H-9241TU17B, H-9241TU17C, H-9241TU17D, H-9241TU17E, H-9241TU17A, C, H-9246U17A, H-9246U17B, H-9271T17A, H-9271TU17A, H-9271TU17B, H-9271TU17C, H-9271TU17D, H-9271TU17E, H-9271TU17A, H-9297U17A, H-9297U17B, H-9297U17C, H-9297U17D, H-9297U17E, H-9297U17A, H-9321T17A, H-9321TU17A, H-9321TU17B, H-9321TU17C, H-9321TU17D, H-9321TU17E, H-9321TU17A, H-9321U17A, H-9321U17B, H-9321U17C, H-9321U17D, H-9321U17E, H-9321U17A, H-9341T17A, H-9341TU17A, H-9341TU17B, H-9341TU17C, H-9341TU17D, H-9341TU17E, H-9341TU17A, H-9341U17A, H-9341U17B, H-9341U17C, H-9341U17D, H-9341U17E, H-9341U17A, H-9371T17A, H-9371TU17A, H-9371TU17B, H-9371TU17C, H-9371TU17D, H-9371TU17E, H-9371TU17A, H-9371U17A, H-9371U17B, H-9371U17C, H-9371U17D, H-9371U17E, H-9371U17A, H-9401T17A, H-9401TU17A, H-9401TU17B, H-9401TU17C, H-9401TU17D, H-9401TU17E, H-9401TU17A, H-9401U17A, H-9401U17B, H-9401U17C, H-9401U17D, H-9401U17E, H-9401U17A, H-9421T17A, H-9421TU17A, H-9421TU17B, H-9421TU17C, H-9421TU17D, H-9421TU17E, H-9421TU17A, H-9421U17A, H-9421U17B, H-9421U17C, H-9421U17D, H-9421U17E, H-9421U17A, H-9451T17A, H-9451TU17A, H-9451TU17B, H-9451TU17C, H-9451TU17D, H-9451TU17E, H-9451TU17A, H-9451U17A, H-9451U17B, H-9451U17C, H-9451U17D, H-9451U17E, H-9451U17A, H-9481T17A, H-9481TU17A, H-9481TU17B, H-9481TU17C, H-9481TU17D, H-9481TU17E, H-9481TU17A, H-9481U17A, H-9481U17B, H-9481U17C, H-9481U17D, H-9481U17E, H-9481U17A, H-9501T17A, H-9501TU17A, H-9501TU17B, H-9501TU17C, H-9501TU17D, H-9501TU17E, H-9501TU17A, H-9501U17A, H-9501U17B, H-9501U17C, H-9501U17D, H-9501U17E, H-9501U17A, H-9521T17A, H-9521TU17A, H-9521TU17B, H-9521TU17C, H-9521TU17D, H-9521TU17E, H-9521TU17A, H-9521U17A, H-9521U17B, H-9521U17C, H-9521U17D, H-9521U17E, H-9521U17A, H-9541T17A, H-9541TU17A, H-9541TU17B, H-9541TU17C, H-9541TU17D, H-9541TU17E, H-9541TU17A, H-9541U17A, H-9541U17B, H-9541U17C, H-9541U17D, H-9541U17E, H-9541U17A, H-9561T17A, H-9561TU17A, H-9561TU17B, H-9561TU17C, H-9561TU17D, H-9561TU17E, H-9561TU17A, H-9561U17A, H-9561U17B, H-9561U17C, H-9561U17D, H-9561U17E, H-9561U17A, H-9581T17A, H-9581TU17A, H-9581TU17B, H-9581TU17C, H-9581TU17D, H-9581TU17E, H-9581TU17A, H-9581U17A, H-9581U17B, H-9581U17C, H-9581U17D, H-9581U17E, H-9581U17A, H-9601T17A, H-9601TU17A, H-9601TU17B, H-9601TU17C, H-9601TU17D, H-9601TU17E, H-9601TU17A, H-9601U17A, H-9601U17B, H-9601U17C, H-9601U17D, H-9601U17E, H-9601U17A, H-9621T17A, H-9621TU17A, H-9621TU17B, H-9621TU17C, H-9621TU17D, H-9621TU17E, H-9621TU17A, H-9621U17A, H-9621U17B, H-9621U17C, H-9621U17D, H-9621U17E, H-9621U17A, H-9641T17A, H-9641TU17A, H-9641TU17B, H-9641TU17C, H-9641TU17D, H-9641TU17E, H-9641TU17A, H-9641U17A, H-9641U17B, H-9641U17C, H-9641U17D, H-9641U17E, H-9641U17A, H-9661T17A, H-9661TU17A, H-9661TU17B, H-9661TU17C, H-9661TU17D, H-9661TU17E, H-9661TU17A, H-9661U17A, H-9661U17B, H-9661U17C, H-9661U17D, H-9661U17E, H-9661U17A, H-9681T17A, H-9681TU17A, H-9681TU17B, H-9681TU17C, H-9681TU17D, H-9681TU17E, H-9681TU17A, H-9681U17A, H-9681U17B, H-9681U17C, H-9681U17D, H-9681U17E, H-9681U17A, H-9701T17A, H-9701TU17A, H-9701TU17B, H-9701TU17C, H-9701TU17D, H-9701TU17E, H-9701TU17A, H-9701U17A, H-9701U17B, H-9701U17C, H-9701U17D, H-9701U17E, H-9701U17A, H-9721T17A, H-9721TU17A, H-9721TU17B, H-9721TU17C, H-9721TU17D, H-9721TU17E, H-9721TU17A, H-9721U17A, H-9721U17B, H-9721U17C, H-9721U17D

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Westinghouse PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.295ADC	V15920-1	1023A	MR350	6S350	6Q4	350A	
M2	.295ADC	V15920-1	1023A	MR350	6S350	6Q4	350A	

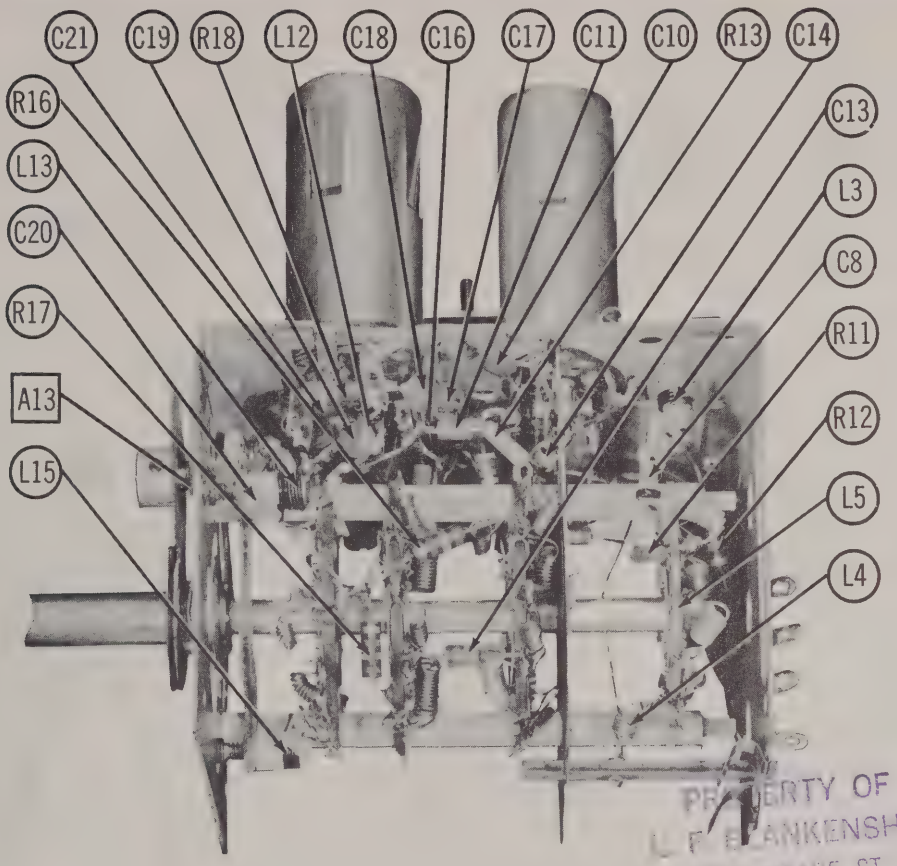
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		Westinghouse PART No.	SYLVANIA PART No.	
M3	1N64 *	V-10916	1N60	Video Det. (Pigtail) - Chassis V-2341-35, V-2341-45, V-2351-304, V-2351-404.
	CK706A	V-10916-3	1N60	Video Det. (Snap-in)-Chassis V-2340-25, V-2350-204, V-2341-15, V-2341-25, V-2351-204.

* Some versions may use crystal diode type CK706 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M4	Tuner	V-16050-1	VHF-Chassis V-2340-25, V-2341-15, V-2341-25, V-2341-35, V-2341-45
	Tuner	V-15560-1	VHF-Chassis V-2341-41
M5	Tuner	V-15900-1	VHF-UHF Combination, Consists of VHF Tuner (Part #V-15860-1) & UHF Tuner (Part #V-15870-1) Chassis V-2350-204, V-2351-204, V-2351-304, V-2351-404
M6	Video Det. Assy.	V-15686-1	Includes M3, Coils, & capacitors-Chassis V-2340-25, V-2350-204, V-2341-15, V-2341-25, V-2351-204
	Video Det. Assy.	V-12128-3	Includes M3, Coils, & Capacitors -Chassis V-2341-35, V-2341-45, V-2351-304, V-2351-404
M7	Integrator	V-1566-1	Vertical-Centralab #PC-104, Sprague #103C12
M8	Centering Device		Part of Deflection Yoke (T3) Rear Cover
M9	Ion Trap	V-9784-4	
B1	Trimmer Cap.	V-11228-5	Horiz. Multivibrator (5-80MMF)
	Cabinet	V-1405-12	Models H-924T21C, H924TU21C, H-924T21A, H-924TU21A
	Cabinet	V-1405-9	Models H-927T21C, H-927TU21C
	Cabinet	V-1405-10	Models H-928T21C, H-928TU21C
	Cabinet	V-1405-11	Models H-929T21C, H-929TU21C
	Cabinet	V-1396-11	Models H-916T17A, H-916TU17A
	Cabinet	V-1396-8	Models H-919T17A, H-919TU17A
	Cabinet	V-1396-9	Models H-920T17A, H-920TU17A
	Cabinet	V-1396-10	Models H-921T17A, H-921TU17A
	Knob	V-15217-4	VHF Channel Selector-Models H-924T21C, H-924T21A, H-916T17A
	Knob	V-15217-2	VHF Channel Selector-Models H-919T17A, H-920T17A, H-921T17A, H-927T21C, H-928T21C, H-929T21C
	Knob	V-15218-2	VHF Channel Selector-Models H-927TU21C, H-928TU21C, H-929TU21C, H-919TU17A, H-920TU17A, H-921TU17A
	Knob	V-15218-4	VHF Channel Selector-Models H-916TU17A, H-924TU21A, H-924TU21C
	Knob	V-15223-2	UHF Coarse & Fine Tuning-Models H-924TU21C, H-924TU21A, H-916TU17A
	Knob	V-15223-1	UHF Coarse & Fine Tuning-Models H-927TU21C, H-928TU21C, H-929TU21C, H-919TU17A, H-920TU17A, H-921TU17A
	Knob	V-15223-4	VHF Fine Tuning-Models H-919T17A, H-920T17A, H-921T17A, H-927T21C, H-928T21C, H-929T21C
	Knob	V-15223-7	VHF Fine Tuning-Models H-916T17A, H-924T21A, H-924T21C
	Knob	V-15219-5	VHF Fine Tuning-Models H-924TU21C, H-924TU21A, H-916TU17A
	Knob	V-15219-4	VHF Fine Tuning-Models H-927TU21C, H-928TU21C, H-929TU21C, H-919TU17A, H-920TU17A, H-921TU17A
	Knob	V-14683-5	Horiz. Hold, Vertical Hold, & Brightness- Models H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C, H-919T17A, H-919TU17A, H-920T17A, H-920TU17A, H-921T17A, H-921TU17A
	Knob	V-14683-7	Horiz. Hold, Vert. Hold, & Brightness-Models H-916T17A, H-916TU17A, H-924T21A, H-924TU21A, H-924T21C, H-924TU21C
	Knob	V-15224-2	Picture-Models H-924TU21C, H-924TU21A, H-916TU17A
	Knob	V-15224-1	Picture-Models H-919TU17A, H-920TU17A, H-921TU17A, H-927TU21C, H-928TU21C, H-929TU21C
	Knob	V-15224-4	Picture-Models H-919T17A, H-920T17A, H-921T17A, H-927T21C, H-928T21C, H-929T21C
	Knob	V-15224-7	Picture-Models H-924T21A, H-916T17A, H-924T21C
	Knob	V-15226-4	On-off-volume-Models H-916T17A, H-916TU17A, H-924T21A, H-924TU21A, H-924T21C, H-924TU21C
	Knob	V-15226-2	On-off-volume-Models H-919T17A, H-919TU17A,H-920T17A, H-920TU17A, H-921T17A, H-921TU17A, H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C
	Knob	V-15225-1	UHF Dial-Models H-919TU17A, H-920TU17A, H-921TU17A, H-927TU21C, H-928TU21C, H-929TU21C, H-924TU21A, H-916TU17A, H-924TU21C
	Safety Glass	V-15430-1	Models H-916T17A, H-916TU17A,
	Safety Glass	V-16031-1	Models H-924T21A, H-924TU21A, H-924T21C, H-924TU21C
	Safety Glass	V-15446-2	Models -H-927T21C, H-927TU21C, H-928T21C, H-928TU21C, H-929T21C, H-929TU21C
	Safety Glass	V-15998-1	Models H-919T17A, H-919TU17A, H-920T17A, H-920TU17A, H-921T17A, H-921TU17A



RF TUNER-RIGHT SIDE

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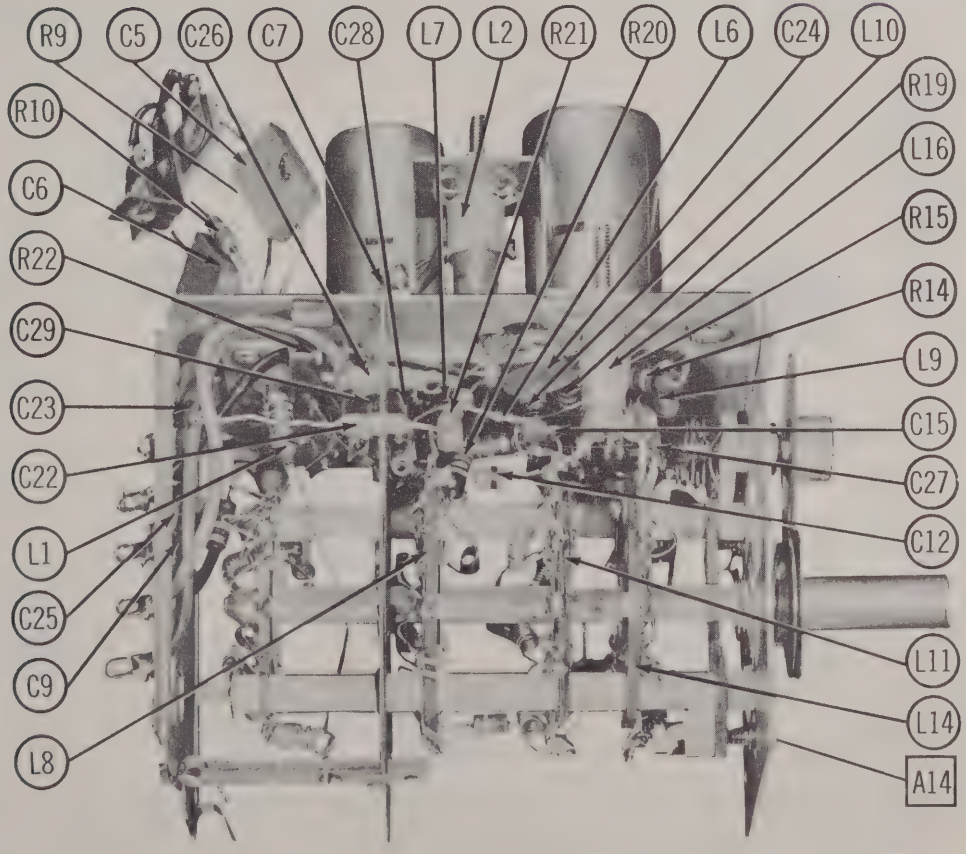
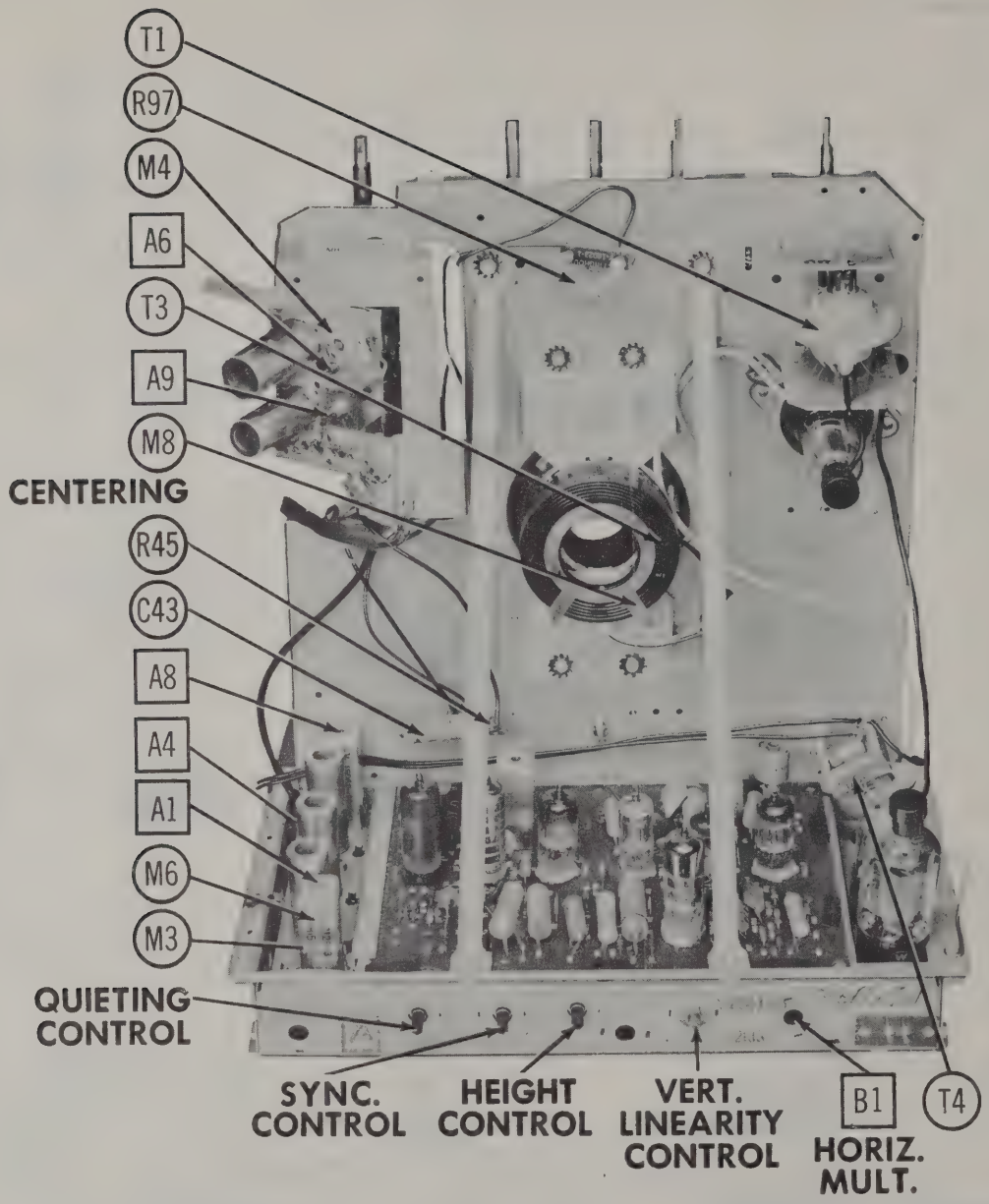
L. F. BLANKENSHIP
3024 MEADE ST.
DENVER, COLORADO



RF TUNER-LEFT SIDE



CHASSIS—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the horizontal hold control (R2) to its mid-range position.

Connect a short across the horizontal coil (L28). Connect the DC probe of a VTVM to pin 7 (grid) of V13. Common to chassis.

Adjust the horizontal multivibrator trimmer (B1) for zero reading on meter. If necessary, turn the horizontal hold control slightly to obtain zero reading.

Remove the jumper from L28 and adjust the horizontal frequency slug (B2) for zero reading on the VTVM. Switch off channel and back again. Picture should immediately pull into sync.

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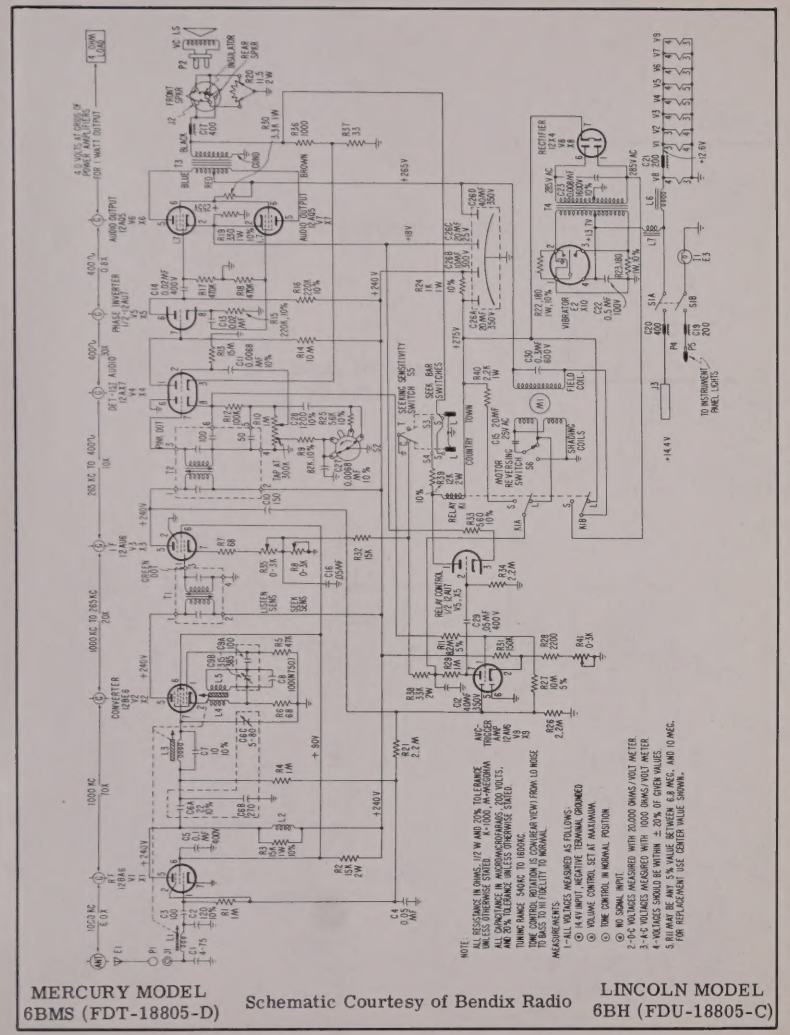
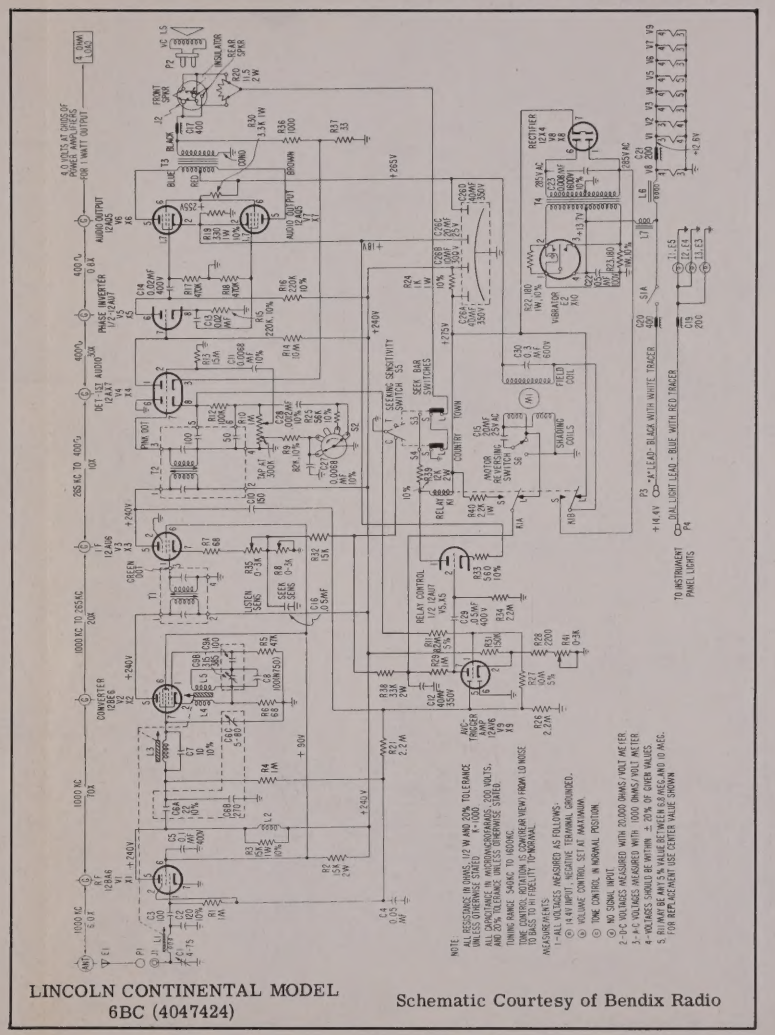
DENVER, COLORADO



MERCURY MODEL
6BMS (FDT-18805-D)

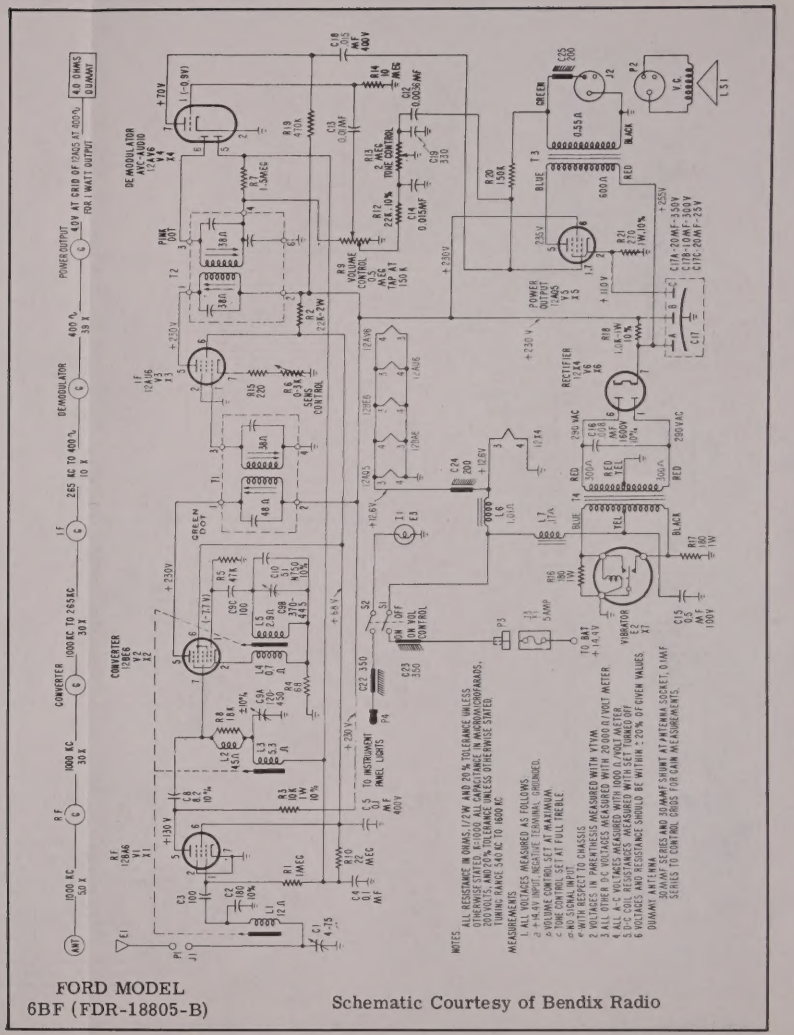
Schematic Courtesy of Bendix Radio

LINCOLN MODEL
6BH (FDU-18805-C)



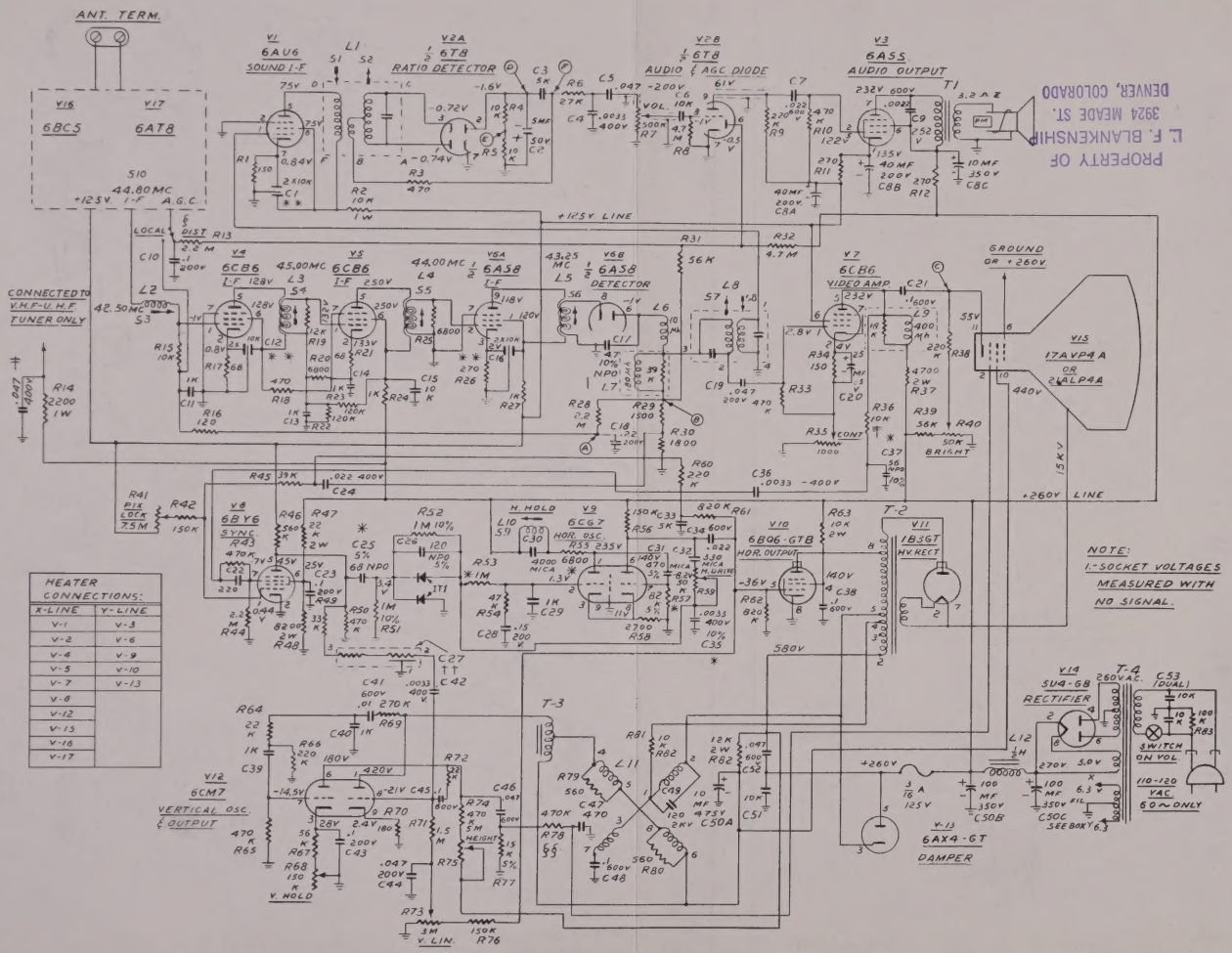
LINCOLN CONTINENTAL MODEL
6BC (4047424)

Schematic Courtesy of Bendix Radio



FORD MODEL
6BF (FDR-18805-B)

Schematic Courtesy of Bendix Radio



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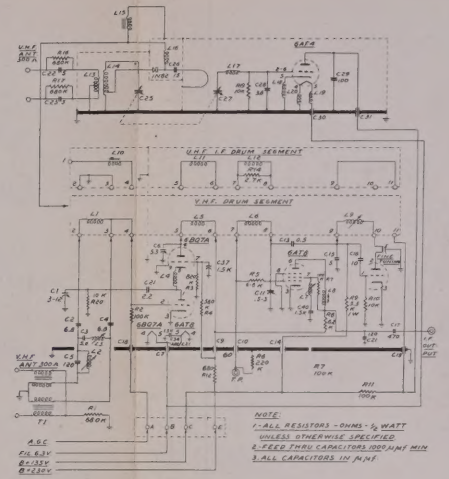

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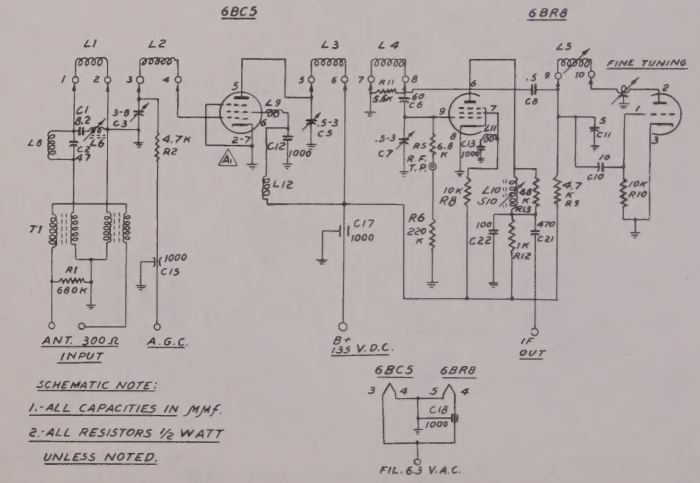
3924 MEADE ST.
DENVER, COLORADO

Schematic Courtesy of Packard-Bell Company, Inc.

PACKARD-BELL MODELS

17VT1	(Ch. V8-1)
17VT1U	(Ch. V8-1)
21VT1	(Ch. V8-1)
21VT1U	(Ch. V8-1)



SCHEMATIC NOTE:
1.-ALL CAPACITIES IN MMF.
2.-ALL RESISTORS ½ WATT UNLESS NOTED.

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